Republic of Benin

Ex-Post Evaluation of Japanese Grant Aid Project

" The Project for Rural Water Supply (Phase VI)"

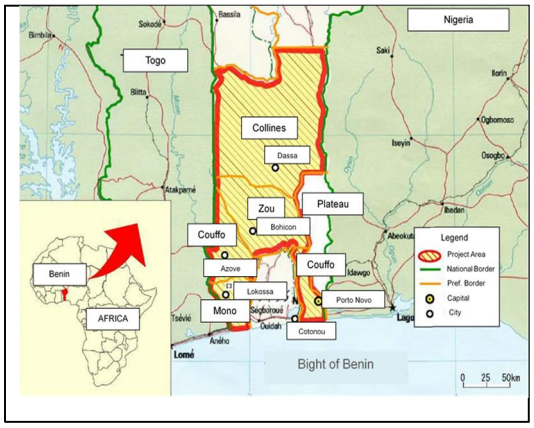
External Evaluator: Chiaki Yamada, Japan Economic Research Institute Inc.

0. Summary

The objective of this project is to increase the number of people with reliable access to safe water in the five targeted departments in rural Benin (Collines, Zou, Couffo, Mono and Ouémé) by constructing water facilities, and thereby improve the standard of living in these departments. This project has been highly relevant to the Benin's development plan and development needs, as well as Japan's ODA policy, so its relevance is high. The efficiency of both the project cost and project period were within the plan and the efficiency of the Project is high. The ex-post evaluation confirmed that the operational rate of deep wells with hand pumps (hereafter Level 1) and small-scale water supply facilities (hereafter Level 2) developed by the Project has exceeded the 80% target value. Furthermore, it is confirmed the number of people who had access to safe and stable water increased by approximately 89,000. Improvement of hygienic conditions due to the provision of safe water and reductions in water-borne diseases and water-fetching labor were confirmed as positive impacts, resulting in improved school enrollment rates and an improved standard of living amongst women. Accordingly, the effectiveness and impacts are high. The operational rate for water facilities is very high (83.1% for Level 1 and 100% for Level 2), and it is summarized that almost all of these facilities are properly maintained. However, small problems were observed in operation and maintenance (hereafter O&M) with regard to the institutional, technical, and financial aspects for Level 1, and to the financial aspect for Level 2. There is clearly still room for the Government of Benin to improve the capacity to manage the facilities, and thus the sustainability of the effect is rated as fair.

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

1. Project Description



Project Locations

Level 2 Facilities (left) and Level 1(right) Facilities Developed by the Project

1.1 Background

According to World Bank in 2003, in rural areas of Benin (where about 70 % of the population is living), the rate of access to safe and reliable water remained at approximately 36 % and the levels of coverage for water supply and sanitary services remained low. As a result, the population was more prone to water-borne diseases, and children were obliged to drop out of school to fetch water. Overall, negative impacts upon their health, education, and economies were observed. In order to tackle the negative impacts, the “Millennium Development Goals (MDGs)” (2000-2015) formulated by the Government of Benin in 2000 stated that the water supply rate in rural areas should be raised to 85% by 2015. Since then, donors such as the Government of Japan, the United Nations Children's Fund (UNICEF), and the German Agency for International Cooperation (GIZ) have been promoting the development of water supply facilities in these areas. However, as the water supply rate still remained low in 2005, the target rate by 2015 unavoidably had to be revised downward to 67.3%. In order to boost the water supply rate, the further development of water facilities was required.

Under the above circumstances, the Government of Benin requested the Government of Japan to implement the Project entitled“ The Project for Rural Water Supply (Phase VI)” in June 2005, with funding from grant aid focused on the poorest rural areas in Southern Benin.

1.2 Project outline

The objective of this project is to increase the number of people with reliable access to safe water in the five targeted departments in rural Benin (Collines, Zou, Couffo, Mono and Ouémé) by constructing water facilities, and thereby improve the standard of living in these departments.

Grant Limit[1] / Actual Grant Amount[2]	1,041 million yen / 762 million yen
Exchange of Notes Date (/Grant Agreement Date)	July, 2009 / July, 2009
Implementing Agency	Directorate General of Water, Ministry of Energy, Petroleum and Mineral Research, Water and Renewable Energy Development（Direction Générale de l'Eau du Ministère de l'Energie, des Recherches Pétrolières et Minières, de l'Eau et du Développement des Energies Renouvelables）(hereafter DG Eau）
Project Completion Date	May, 2011
Main Contractor	Water & Geo-tech Engineers Nissaku
Main Consultant	Sanyu Consultants Inc.
Basic Design (B/D)	September, 2007-November, 2008
Detailed Design (D/D)	March, 2009-November,2009
Related Projects	<Grant Aid Project> The Project for Rural Water Supply (Phase I-V) (1984-2007) <Other International Organization and donors> UNICEF "Projet d'Approvisionnement en Eau Potable et Assainissement de Base dans 200 Localites Vulnerables" (2006-2011), GIZ "Programme d'Assistance au Developpement du Secteur de l'Approvisionnement en Eau Potable et de l'Assainissement en Milieu Rural"(2009-2011), Government of the Netherlands "Programme pluriannuel d'appui au secteur Eau et Assainissement II (PPEA-II)" (2012-2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Chiaki Yamada, Japan Economic Research Institute Inc.[3]

2.2 Duration of Evaluation Study

Duration of the Study: October, 2014 - September, 2015

Duration of the Field Study: January 7 - 26, 2015 and April 6 - 10, 2015

[1] In other words, Exchange of Notes Limit
[2] The amounts of Detailed Design (60 million yen/58 million yen) are included.
[3] The evaluator is a subcontractor from INGÉROSEC Corporation.

2.3 Constraints during the Evaluation Study

One hundred and twenty-four Level 1 and ten Level 2 facilities (including 80 common faucets) were developed by the Project in the five target departments. The Level 1 and Level 2 facilities are spread out within the five departments (about 25,000km^2). Due to limitations in budget and time, the current functioning and O&M status were not thoroughly monitored for all of the Level 1 and Level 2 facilities through the field study of the ex-post evaluation. Accordingly, a beneficiary survey[4] and telephone interviews with the communes[5] responsible for O&M of the facilities were conducted to collect information on the Level 1 and Level 2 facilities that were not observed through the field study.

3. Results of the Evaluation (Overall Rating: A[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Relevance to the Development Plan of Benin

3.1.1.1 Relevance to Higher Development Plan

During the project planning stage, three goals were designated as priority targets in the "Poverty Reduction Strategy Paper II (PRSP II) 2007-2009" formulated as the development plan for Benin: "Promoting sustainable economic development," "Improvement of basic services," and "Promotion of good governance." Through activities for the improvement of basic services, the development plan targeted an increase in the rural water supply from 46 % (2006) to 51 % (2010). At the same time, the Millennium Development Goals (MDGs) targeted an increase of the rural water supply rate to 85 % by 2015. However, the World Bank's study conducted in 2003 revealed that the access rate to safe water remained at approximately 36 % in the rural areas of Benin, where 70 % of the population lives. As a result of the review, the targeted rural water supply rate in December 2015 was revised downward to 67.3%.

During the ex-project evaluation, the following five sectors were designated as priority issues in the "Poverty Reduction Strategy Paper III (PRSP III) 2011 - 2015" revised and formulated in 2011: 1) Sustainable Acceleration of Growth and Transformation of the Economy, 2) Infrastructure Development, 3) Strengthened Human Capital, 4) Improvement in the Quality of Governance, and 5) Balanced and Sustainable Development at the National Level." "Water and sanitation infrastructure" is recognized as the issue of top

[4] The survey team interviewed 241 beneficiaries (43 in Collines, 43 in Zou, 56 in Couffo, 51 in Ouémé and 48 in Mono department) who are currently using the facilities developed by the Project from February to March 2015 in the five targeted departments. The objective of the survey was to collect information on the operational status of the facilities, project effects, and impacts generated.
[5] Local administrative authorities
[6] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[7] ③: High, ②: Fair, ①: Low

focus in "2. Infrastructure Development," and the target rural water supply rate to be achieved by 2015 was set at 67.3 %[8]. "Goal 7: Ensure Environmental Sustainability" in the MDGs mentioned above aimed to halve the proportion of the population without sustainable access to safe drinking water and sanitary facility by 2015. And the targeted rural water supply rate continuously remained at 67.3% by 2015.

3.1.1.2 Relevance to Water Sector Plan

During the project planning stage, the "National Strategy for Rural Water Supply 2005-2015" aimed to increase the water-served population in rural areas up to 3.9 million within 10 years from 2005. According to the "Public Investment Program (PIP)" which placed Infrastructure investment, Water and Electricity, Health, Agriculture and Education as top priorities, the amounts of investment towards Water and Electricity between 2005 and 2007 had greatly increased from 10,596 million Franc CFA (hereafter F.CFA) to 36,415 million F.CFA. The percentage of the investment towards Water and Electricity out of all the public investments had also increased from 6.2% to 12.7 %. The "National Strategy for Rural Water Supply 2005-2015" was still in practice during the ex-post evaluation. This strategy emphasized the need for community initiatives on the O&M of facilities and appropriate and secure water fare collection in order for communities to take initiatives for the sustainable management of their water facilities.

In addition to the above, the "Growth Strategy for Poverty Reduction 2011-2015 (SCRP)," which was not formulated during the project planning stage, mentioned that the improvement and development of the economic infrastructure (such as road and water supply services) promotes not only national development, but also the life of the people. The "National Water Policy (2008)" outlined the importance of increasing the understanding of people towards drinking water supply and hygiene management in order to contribute to the living standards of the people. The policy also indicated that fair water resource distribution by 2015 to the people would greatly contribute to economic reform and poverty reduction. While none of the PIP documents collected at the ex-post evaluation described the amounts invested in Water and Electricity (investment) out of the total Public Investment, the interview with the DG Eau confirmed that the budgets for the development of the rural water supply facilities gradually increased every year from the time of the project planning to the ex-post evaluation.

Accordingly, the Project was consistent with the National Development Plan and Water Sector Plan both during the project planning stage and the time of the ex-project

[8] In 2011 when the PRSPIII was formulated, the target rural water supply rate to be achieved by 2015 was set to 69.5 %. At the ex-post evaluation, according to the results of interviews with the DG Eau, the target rural water supply rate was revised downward to 67.3%.

evaluation.

3.1.2 Relevance to the Development Needs of Benin

During the project planning stage[9], the average water supply rate of the five targeted departments was 43.2%, which was lower than the national average of 44.5%. According to the result of the interviews with DG Eau conducted during the project planning stage, the development of water facilities was prioritized as the most urgent infrastructure requirement in more than 95% of the targeted communities. Furthermore, the demand for the provision of hygienic water facilities in the communities was urgent.

The Ministry of Health reported that the people in the five targeted departments were more prone to water-borne diseases such as diarrhea, typhoid fever, and cholera. In the Ouémé department, where the water supply rate was the lowest (22.5%), more than 6,000 patients were identified per year (versus 2,000-3,000 patients in the other four departments).

Some of the regions in the five targeted departments have difficulties in developing groundwater due to exposed bedrock. People there have less access to reliable water. It was confirmed that many children there are struggling to go to school due to the long hours required for water-fetching labor. The target departments (Collines, Zou, Couffo, Mono and Ouémé) were selected after the consultation between the Government of Benin and the Government of Japan on the following challenges: high poverty rate, lack of access to safe drinking water (small number of water supply facilities for the population); cost effectiveness, and the assurance of safety in the project implementation. Therefore, the project objective of developing water facilities was in agreement with the development needs on the ground during the project planning stage, and the need for the Project was rated as high.

During the ex-post evaluation, the average water supply ratio and the number of persons supplied by the project facilities in the five targeted departments were both improved. On the other hand, there are still many people who lack access to safe water. The population growth rate in the five targeted departments was 3.09% (2002-2013), and this growth rate is expected to continue[10]. As such, the water facilities in the targeted departments will not possibly be sufficient and the needs in these areas will remain high.

3.1.3 Relevance to Japan's ODA Policy

According to "ODA data book (2008)," in consideration of the poverty situation in Benin, Basic Human Needs (BHN) (i.e., education, water, and health sectors that contribute to the improvement of living standards) were prioritized as a basic policy. The Project, which aims to contribute to the improvement of hygiene through the provision of water facilities, is therefore

[9] During the project planning stage: the information source is Basic Design Study Report.
[10] The information source is the questionnaire to DG Eau.

relevant to the Japan's ODA policy and priority sectors.

As mentioned above, this project has been highly relevant to the Benin's development plan (including water sector plan) and development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

3.2.1.1 Outputs from Japanese Side

All facilities, Level 1 and Level 2 (elevated water tank, transmission and distribution pipe, public faucet), were developed by the Project as planned. Details of facilities developed are shown in Table 1 and Table 2. Note that, out of 124 facilities for Level 1, six turned out to be artesian wells. Appurtenant facilities were therefore placed instead of hand pumps.

Table 1 Planned and Actual of the Project Outputs (Level 1)

Name of Departments	Planned	Actual	
	No of hand pumps	No of hand pumps	No of artesian wells
Collines	34	36	0
Zou	35	36	3
Couffo	13	12	0
Ouémé	19	19	0
Mono	23	15	3
Total	124	118	6

Source：Planned：Basic Design (B/D) Study Report, Actual：Results of the questionnaires for DG Eau

Table 2 Planned and Actual of the Project Outputs (Level 2)

Name of outputs	Planned	Actual
Small-scale water supply facilities	Total：10 Collines : 1　Zou : 3 Couffo : 2　Ouémé : 3 Mono : 1	Total：10 Collines : 1　Zou : 3 Couffo : 2　Ouémé : 3 Mono : 1
Elevated water tanks (m^3)	$20m^3$x4, $30m^3$x3, $40m^3$x3	$20m^3$x4, $30m^3$x3, $40m^3$x3
Transmission and distribution pipe (length)	31,890m	31,890m
Public faucets	80	80

Source：Planned：B/D Study Report, Actual：Results of the questionnaires for DG Eau

3.2.1.2 Outputs from Benin Side

According to the interviews with DG Eau and the project consultant, 8 out of 10 project outputs, or the equivalent of 21.8 million yen out of the total planned 25 million yen from the

Benin side, were confirmed. This is equal to 87.2% of the planned amount at the ex-post evaluation. Details of the Benin side outputs and the explanations for uncompleted outputs are shown in Table 3.

Table 3 Planned and Actual Outputs from the Benin Side and Implementation Status

Outputs		Implementation Status
1	To secure necessary land, office space, and budget for the project implementation	Completed
2	To conduct awareness activities at 10 facilities for Level 2 and 124 facilities for Level 1.	Completed
3	To secure the costs for connecting the commercial power lines for the 5 facility sites for Level 2	Completed
	Due to budget shortfalls during the Project, no activities for connecting the commercial power with facilities were conducted. Instead, this work was done after the completion of the Project. The facilities are designed to run on generators, but connection between commercial power lines and facilities was planned to save maintenance costs for the generators in the future. Therefore, the delays in connecting the commercial power lines had no effect on the project progress.	
4	To install fences around 10 facilities (Level 2)	Uncompleted
	Fences were set up in only 4 out of 10 facilities (Level 2) due to budget shortfalls but this had no effect on the progress of the Project.	
5	To secure the project supervisors and costs.	Completed
6	To exempt taxes for all imported materials and equipment necessary for the Project.	Completed
7	To secure the way within Benin for shipping and transporting equipment related to the Project.	Completed
8	To secure the safety of Japanese engineers.	Completed
9	To pay bank commissions based on the B/A[11].	Completed
10	To secure the costs for the regular monitoring after the construction of the facilities (2 people x 12 months).	Uncompleted
	During the project planning stage, the team planned to engage two monitoring staff persons from DG Eau. However, with the process of national decentralization, the responsibility for regular monitoring was moved from DG Eau to the communes. Therefore, DG Eau no longer needed to allocate staff.	

Source：Planned：B/D Study Report, Actual：Results of the questionnaires for DG Eau

3.2.1.3 Type/Details of Changes on the Project Components during the Project

Three changes from the B/D and the Detailed Design (D/D) were confirmed. Interviews with DG Eau and the project consultant revealed that these changes were appropriate and necessary to generate the project outcomes. Details on and reasons for the changes are shown in Table 4.

[11] The Government of Benin will open a bank account in Japan and the project money for the grant aid will be transferred to that account. This procedure mentioned above is referred to as the “Banking Arrangement: B/A.”

Table 4 Changes Made and the Reasons for the Changes

NO	Changes made	Reasons for the changes
1	・ Change in the beam section design for Level 2 ・ Re-conduct pumping test and water quality analysis for Level 2 facilities	・ Top part of the beam section design needed to be changed to secure enough strength of the structure ・ Two years had passed since B/D and there was a possibility that the results of the pumping test and water quality analysis had changed
2	・ Change the design at 6 artesian well facilities, out of 124 facilities for Level 1	・ It was uncertain if any artesian wells could be found. Artesian wells do not require hand pumps, so water supply taps were fitted instead
3	・ Canceled the original 8 target sites due to other donor's intention to construct water facilities. Accordingly raised the priority of the 8 sites from alternative sites to target sites ・ Newly identified 28 candidate sites	・ In coordinating with other donors who intend to construct water facilities, several sites were changed from the original plan in order to avoid duplication ・ The number of new candidate sites was determined from the estimated success rate of the borehole drilling called for in the existing documents and field assessment

Source：Results of the questionnaires for DG Eau

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost from the Japanese side was 762 million yen, while the planned cost (limit on E/N of grant aid) was 1,041 million yen. Therefore, the actual project cost was lower than planned (73% of the planned cost). The decreased cost was attributed to the competitive bidding, which reduced the order contract prices from the estimates. The actual project cost from the Benin side was 21.8 million yen, which was also lower than the plan (25 million yen). Two conditions accounted for much of the difference between the planned and actual costs from the Benin side: six of the fences from the Level 2 facilities were not installed; and no monitoring costs were charged.

3.2.2.2 Project Period

The planned project period was a total of 28 months between January 2009 (E/N date) and May 2011. The actual project period was 25.8 months between March 2009 and May 2011, which was shorter than planned (92% of the planned period). Breaking down the project period, the period between the time of agreement with the contractors and the completion of the construction work was as planned. The period for the D/D turned out to be shorter than planned. This reduction can be credited to the efforts of the consultants.

As mentioned above, both the project cost and project period were as the plan. Therefore, efficiency of the Project is high.

3.3 Effectiveness[12] (Rating:③)

3.3.1 Quantitative Effects

As no operation indicators were set during the project planning stage, the operational status of the water facilities (Level 1 and Level 2) was considered as an operation indicator at the ex-post evaluation. The quantitative effects in the project effectiveness was evaluated based on the operational status of the Level 1 and Level 2 facilities (an operation indicator) and water served population as well as water supply rate (effect indicators).

3.3.1.1 Operation Indicators

(1) Operational status of the water facilities

The target ratio for the operational status of the water facilities was not set at the project planning stage but the project objective had already been set as follows: "the number of population who can acquire the safe and reliable water increases." The operation of all facilities developed by the Project was therefore a prerequisite condition, and the targeted operational status was presumed to be 100% at the ex-post evaluation.

Furthermore, if the operational rate[13] of the water facilities developed by the Project went beyond 80% at the ex-post evaluation, the operational rate was to be evaluated as high, which would result in a high effectiveness overall[14].

It was confirmed that 83% of the Level 1 facilities and 100% of the Level 2 facilities were operational at the ex-post evaluation (See Tables 5 and 6). The operational rate for the Level 1 and Level 2 facilities were both beyond 80%, with the conditional expectation that most of the non-operational facilities would be repaired in the months ahead. The effectiveness in terms of the operational level of the water facilities is rated as high.

Table 5 Operational Status of Level 1 (124 Facilities)

Name of Department	Number of facilities		Reason(s) for the non-operational status (Number of facilities not functioning)	Response to the non-operational facilities (Number of facilities)	Operational rate (%)
	Operational	Not-operational			
Collines	36		Broke down (1)	・Planned to be operated by the end of April 2015 (1)	97.2
	35	1			
Zou	39		Broke down (2)	・Repair fees are being collected from the Community. The operational time to be spent is not determined (1) ・Planned to be operated by the end of March 2015 (1)	94.8
	37	2			

[12] Sub-rating for Effectiveness is to be put with consideration of evaluation of the Impact.
[13] Concerning the operational rate, facilities that were operational at the end of February in 2015 were "Operational facilities at the ex-post evaluation," and the operational rate was calculated accordingly.
[14] This is based on the rating system and criteria of the ex-post evaluation.
(http://www.jica.go.jp/activities/evaluation/general_new/2011/pdf/shiryou_02.pdf)

Couffo	12 8 4	Broke down（4）	・Planned to be operated by the end of March 2015 (1) ・Planned to be operated by the end of June 2015 (1) ・Planned to be operation by the end of December 2015 (2)	58.3
Ouémé	19 12 7	Broke down（2） Depletion in dry season（5）	・Planned to be operated by the end of June 2015 (2) ・Reviewing response (5)	63.1
Mono	18 11 7	Broke down（7）	・Planned to be operated by the end of March 2015 (1) ・Planned to be operated by the end of June 2015 (1) ・Planned to be operation by the end of December 2015 (1) ・Reviewing response (4)	61.1
Total	124 103 21			83.1[15]

Notes：As of February 2015

Source：Results of the 1st field study, the beneficiary survey, and the telephone interviews with the communes

Table 6 Operational/Functioning Status of Level 2 Facilities (10 Facilities)

Name of departments	Submersible motor pump			Public faucets		
	Number of operational facilities	Number of non-operational facilities	Operational rate	Number of operational facilities	Number of non-operational facilities	Operational rate
Collines	1	0	100%	12	0	100%
Zou	3	0	100%	21	0	100%
Couffo	2	0	100%	17	0	100%
Ouémé	3	0	100%	24	0	100%
Mono	1	0	100%	6	0	100%
Total	10	0	100%	80	0	100%

Notes：As of February 2015

Source：Results of the 1st field study, the beneficiary survey and the telephone interviews with communes

3.3.1.2 Effect Indicators

（1）Water served population

At the ex-post evaluation, “the number of people who had access to safe and stable water increases by an approximately 89,000” was set as an indicator of the project effects.

As a result of the project outputs, including the development of water facilities, the number of people who has access to safe and stable water in the target departments in 2011 is estimated to increase by approximately 101,000 based on the population growth rate. That result exceeded the target value of 89,000. Moreover, as the population is

[15] The value is calculated by dividing 103（Number of operational facilities observed, Level 1）by 124（Total number of facilities, Level 1）.

expected to further increase and in light of the operational rates of the water facilities[16], the number of people who has access to safe and stable water is estimated to increase by 97,000 by 2013, two years after the completion of the Project. As all facilities are completed in 2011 and were handed to the Government of Benin, the operational rate of facilities were set to 100%. Some non-operational facilities were confirmed in 2013 and the water served population is lower than that of 2011. However, more people can have access to safe water more than expected, thus, the project objective in terms of the water-served population is likely to be achieved.

Table 7 Changes in Population Having Access to Safe Water

Indicators	Target	Actual[17]	Actual[18]
	2011	2011	2013
	Completion year	Completion year	2 years after completion
Number of people affected by the Project (gained access to safe water) in the targeted area	89,000	101,000	97,000

Source : Target : B/D Study Report、Actual : B/D Study Report and Results of the 1st field study, the beneficiary survey and the telephone interviews with communes

(2) Water supply rate

Table 8 shows water supply rate for each targeted department, the average rate for five departments, and the national average.

Table 8 Water Supply Rates for the Targeted Departments (Unit: %)

Indicator: Water supply rates in the targeted departments (Unit: %)	Baseline	Target	Actual	Actual	Actual
	2007	2013	2011	2012	2013
	Baseline year	2 years after completion	Completion year	1 year after completion	2 years after completion
Collines	57.4	－	65.8	65.2	65.7
Zou	41.6	－	61.0	85.3	80.5
Couffo	46.1	－	60.9	68.8	71.1
Ouémé	22.5	－	37.0	40.4	43.0
Mono	48.5	－	80.7	84.5	78.3
Average in 5	43.2	－	61.1	68.8	67.7

[16] There is no data on the operational water facilities in 2011. Presuming that the facilities are broken at a fixed probability and are repaired whenever broken, the operational ratio reaches the ratio in 2015: thus the resulting operational rate is generally used for the calculation.

[17] This value is calculated by: "Water-Served Population 400 people / Level 1 × No of Level 1 × Average population growth rate in the five targeted departments（3.09%）(=A formula)＋Water-Served Population 500 people/Level 2 ×No of Level 2 × Average population growth rate in the five targeted departments（3.09%）(=B formula)
Average population growth rate is multiplied from 2007 when the B/D was conducted by the target year ("average population growth rate" to the power of "target year").

[18] This value is calculated by (A formula)× Operational rate of Level 1（83.1%）＋(B formula)× Operational rate of Level 2（100%）

target department					
National average	44.5	62.7	61.2	68.8	65.6

Notes：No target value determined in 2013

Source：Baseline and Target：B/D Study Report, Actual：Results of the questionnaires for DG Eau

No water supply rate is set for the target departments in 2013. Therefore, comparing the target national average with the actual national average in 2013, the actual national average of 65.6% exceeds the target of 62.7% by 2.9%. The average water supply rate of the five targeted departments was 43.2% during the project planning stage, which was below the national average of 44.5%. A great improvement is recognized, because the average water supply rate of the five departments in 2013 (67.7%) was over the national average (65.6%). Because the targeted indicator was not set during project planning stage, it is difficult to measure the achievement of the water supply rate. In view of the actual water supply rate in 2013, 2 years after the project completion, which went beyond the national average, it is clearly shown that the project improved the water supply rate. Likewise, during the project planning stage, the MDGs (2000 - 2015) targeted improvement in the rural water supply rate to 67.3% by 2015, and this target was already achieved in the five targeted departments by 2013. The interviews with DG Eau indicated that one of the factors responsible for the reduced water supply rate from 2012 to 2013 was the increased population in the targeted departments. Another possible factor was temporal reductions in the water supply rate due to breakdowns in some of the water facilities.

As mentioned in the project outline, UNICEF has targeted improved water supply facilities for the Ouémé and Zou departments since 2006, and GIZ has targeted the same for the Couffo, Ouémé and Mono departments since 2009. According to both organizations, the targeted communities by the Project did not overlap the communities targeted by UNICEF and GIZ.

3.3.2 Qualitative Effects

3.3.2.1 Achievement of Soft Components

As the indicators of the project objective were not set during the project planning and the project implementation stages, it is presumed that the achievement of all outputs is equivalent to the achievement of the project objective in the soft components. Outputs 3 and 5 are considered inappropriate indicators and have been eliminated. These outputs were eliminated because none of the communities' water facility maintenance operations were led by the Water Management Committee or Water User Rights' Unions after the operation and maintenance responsibilities were decentralized to communes. The achievement (status) of Outputs 1, 2 and 4 is shown in Table 9. It can be said that the project objective has been almost achieved.

Table 9 Achievement Status for Each Soft Component

Soft component		Achievement status
Project objective	Community people in the targeted areas properly maintain the water facilities and continuously use water from the facilities	Based on the achievement of outputs 1, 2 and 4, the project objective is almost achieved.
Output 1	DG Eau and the communes understand the method of implementation for the educational activities.	Each commune continues to conduct training in hygiene management/control for the community with funding from budgets from the Government of Benin.
Output 2	Community people understand the importance of hygiene management/control.	The people of the community have a thorough understanding through hygiene education (100%) and have come to wash their hands, clean the water facilities. etc.
Output 3	The water management committee develops an appropriate framework for O&M of water facilities continuously as a leader (the Communities adapted to the original/old method[19]).	Through the introduction of new method, no communities were found to still be using to the old/original method.
Output 4	Appointed water facility officers acting as leaders in targeted communities develop an appropriate sustainable framework for O&M of water facilities (Communities adapted to the new method[20]) (Level 1 facilities).	Twenty-one facilities were run properly by the appointed water facility officers. On the other hand, four facilities were not managed appropriately by the appointed water facility officers. Accordingly, 84% of the total water facilities are said to be properly managed.
Output 5	Water user rights' unions act as leaders in the targeted community to prepare/develop a sustainable framework for O&M of water facilities (the Communities adapted to the new method).	Through the introduction of the new method, O&M of water facilities is being conducted by private firms contracted with the communes.

Source：Soft components：B/D Study Report, Achievement status：Results of the questionnaires for DG Eau

3.3.2.2 Improvement in Water Quality

It was agreed that when the Project had drilled new boreholes, the water quality test would be conducted based on the drinking water standards of Benin, and that a borehole would be available as a water source only after the standards were met.

Accordingly, the quality of the water provided by the water facilities of the Project is assured. At the ex-project evaluation, it was confirmed that the quality of water from the facilities developed by the Project had been tested as planned. The results of the beneficiary

[19] Water Management Committees (Level 1) and Water User Rights unions (Level 2) were established, and the costs for the development of water facilities were collected by community people. The facilities were operated and maintained by these bodies.

[20] The O&M of water facilities by the new method was commenced in January 2007. Community people are not obliged to pay their share of the expenses for facility construction, and no Water Management Committee or Water User Rights' unions are established. The O&M of water facilities is conducted by private firms.

survey revealed that 96.7% of the total respondents (233 out of 241) answered “satisfactory” or “almost satisfactory” to the questions about the quality of the water (smell, water color/cloudiness, taste) provided by the facilities (Level 1 and Level 2). Ninety-percent of the respondents who answered “satisfactory” or “almost satisfactory” cited the following reasons (or the like): “able to drink tasty water,” “able to secure sanitary water and reduce the incidence of diarrhea,” “the water is not smelly like the shallow boreholes,” “the water is not cloudy like river water.” Moreover, staff members from the communes who were responsible for the O&M of water facilities accompanied the team on the 1st field visit for the ex-post evaluation and found no problems with the water quality in their tests of the smell, color/cloudiness, and taste of the water.

3.4 Impacts

3.4.1 Intended Impacts

During the project planning stage, the following 3 expected indicators were set to measure the project effects.

- Providing safe water through the development of water facilities will improve the sanitary conditions and help reduce the incidence of water-borne diseases.
- Decreasing the time and labor for fetching water
- Reducing labor for fetching water will bring secondary effects (improved standard of living for women and improved school enrollment rate)

Occurrence of impacts observed at the ex-post evaluation are shown below.

3.4.1.1 Reduction in the Incidence of Water-borne Diseases

The statistics on the incidence of water-borne diseases available from Ministry of Health were broken down for each department. There were no further breakdowns available by community, so it was difficult to clarify the numerical changes, namely, whether the Project helped reduce the incidence of water-borne diseases in the targeted communities.

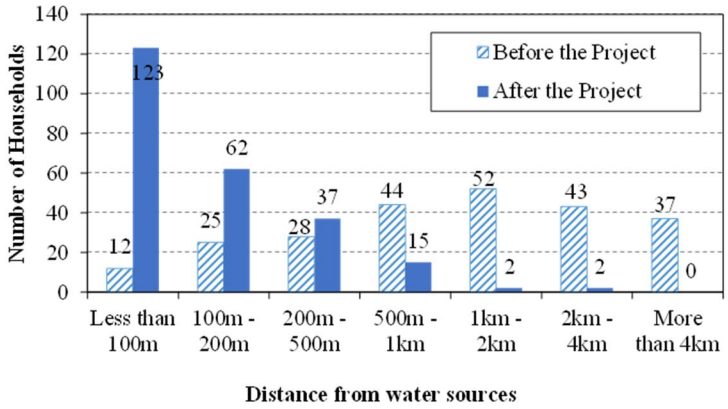
According to the interview results with the Ministry of Health, people are susceptible to water-borne diseases when they suffer malnutrition or live in poor living environments. On the other hand, surely acquiring safe water was one of the factors helping to reduce the incidence of water-borne diseases.

The results of the beneficiary survey pointed out that community people gained access to safe water sources instead of unsanitary water sources through the construction of water facilities under the Project. And comparing before and after the Project, 97.9% (236 out of 241 respondents) answered as follows: “lower incidence of diarrheas,” “lower incidence of stomach pains,” ”The Project has contributed to the improved health condition amongst community people.”

3.4.1.2 Distance to Water Sources

Responses to the question on “distances from each household to the water source” in the beneficiary survey at the ex-project evaluation are shown in Figure 1. Before the Project, approximately 54.8% (132 out of 241 respondents) answered that the distance to the nearest water source was more than 1 km. After the Project, only 1.7% (4 out of 241 respondents) gave the same answer. Before the Project, only approximately 15.4% (37 out of 241 respondents) of the respondents had access to water resources within 200 meters from their houses. After the Project, the percentage improved to 76.8% (185 out of 241 people). On the other hand, 5.8% (14 out of 241 respondents) of the total number of respondents answered, “The distance to the water source is now longer than it was before the Project.”

According to these respondents mentioned above, “A greater distance does not matter, so long as they can surely securing safe water.” This explained why some respondents had voluntarily chosen to come all the way to the new water source developed by the Project to acquire safe water. The distance from each household to the water source during the project planning stage and during the ex-post evaluation is shown in Figure 1.



Source：241 respondents of the beneficiary survey

Figure 1 Distance from Each Household to the Water Houses

3.4.1.3 Reducing Water-fetching Labor

According to the results of the beneficiary survey, about 95.9% (231 out of 241 respondents) answered that the “water-fetching time had been shortened.” Time-saving factors included not only the distance from the water source, but also differences in the methods for fetching water, such as fetching water with pumps instead of ropes with rubber bags attached to the ends of them. Ten of the respondents who answered that the “water-fetching time has not been shortened” explained that they used to collect water from rivers and shallow wells nearby their households before the Project but now are coming to get safe water from the new water facilities in spite of the greater distance.” It was

confirmed with the people mentioned above that although their water-fetching time has not been shortened, they spent less than 1 hour a day for fetching water. Table 10 shows the change for each household in the time spent for fetching water per day before and after the Project.

Table 10 Changes of each Household for Spending Time for Fetching Water per Day

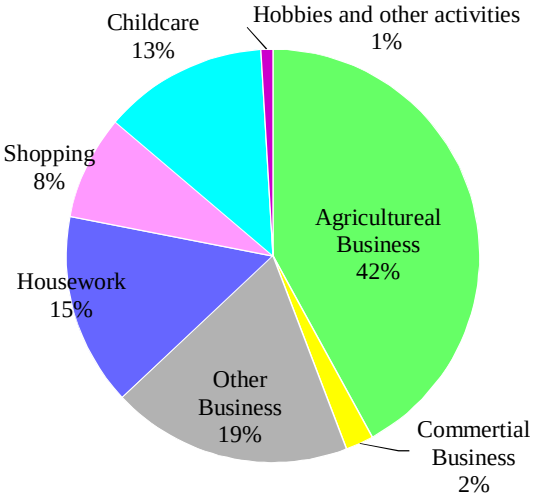
(Unit: Number of households)

Time for fetching water per day	At project planning	At the ex-post evaluation	Average time
Less than 1 hour	87	238	At project planning ： approximately120mins/day At the ex-post evaluation ： Approximately 10mins/day
From 1 hour to 2 hours	70	3	
From 2 hours to 3 hours	38	0	
More than 3 hours	46	0	

Source：Results of the beneficiary survey

3.4.1.4 Secondary Effects from the Reduced Water-fetching Labor

According to the results of beneficiary survey, by securing water source nearby (185 out of 241 respondents answered their households were within 200 meters from water sources), people spend less time fetching water and are instead able to spend more time selling agricultural products in markets and engaging in other activities (childcare, job hunting, etc.). The ex-post evaluation confirmed an increased in harvests as a secondary effect brought from the reduced water-fetching labor. Details on the activities performed in place of water-fetching are shown in Figure 2. All of the respondents had children. Approximately 97.1% (234 out of 241 respondents) answered, “Children spend less time fetching water after school and more time in studying at home.”



Source: Results of the beneficiary survey

Figure 3 Details of the Alternative Time Use Instead of Fetching Water

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

According to the interviews with DG Eau and the beneficiaries, impacts on the natural environment such as problems relating water usage rights, the drying out of boreholes, the excessive use of water, or cases of ground subsidence were not specially observed.

3.4.2.2 Land Acquisition and Resettlement

The interviews with DG Eau and the consultant revealed that because the project facilities were located on common lands for communities, land acquisition and resettlement were not implemented.

3.4.2.3 Other impacts

The interviews with beneficiaries and communes highlighted the promotion of the empowerment of women through the O&M of water facilities as one impact from the Project. Some women announced plans to run as candidates for positions as Level 1 officers and were selected. During the ex-post evaluation, some women proactively involved themselves in O&M of the facilities. Furthermore, 2 out of 10 Level 2 facilities were run by private firms headed by women, and women's involvement in the O&M of the water facilities was confirmed. The interviews with the beneficiaries and interviews with the women involved in the O&M of the water facilities revealed that the Project has further promoted the empowerment of women through O&M by encouraging more women engaged in water-fetching labor to participate in hygiene educational training.

As mentioned above, the ex-post evaluation confirmed that the operational rate of water supply facilities has reached 83.1% effectiveness for Level 1 and 100% effectiveness for Level 2. As a result of the construction of water facilities through the Project, the number of people with continuous access to safe water is estimated to increase by more than 89,000, the target value in 2011. In 2013, two years after the project completion, the number of people who has access to safe water is estimated to increase by 97,000. Therefore, the project objective with regard to the water-served population is considered to be achieved in the targeted areas. The Project had positive impacts by reducing the incidence of water-borne diseases and water-fetching time and labor for women, resulting in more time for women to engage in other economic activities. This project has largely achieved its objective. Therefore, effectiveness and impact of the Project are high.

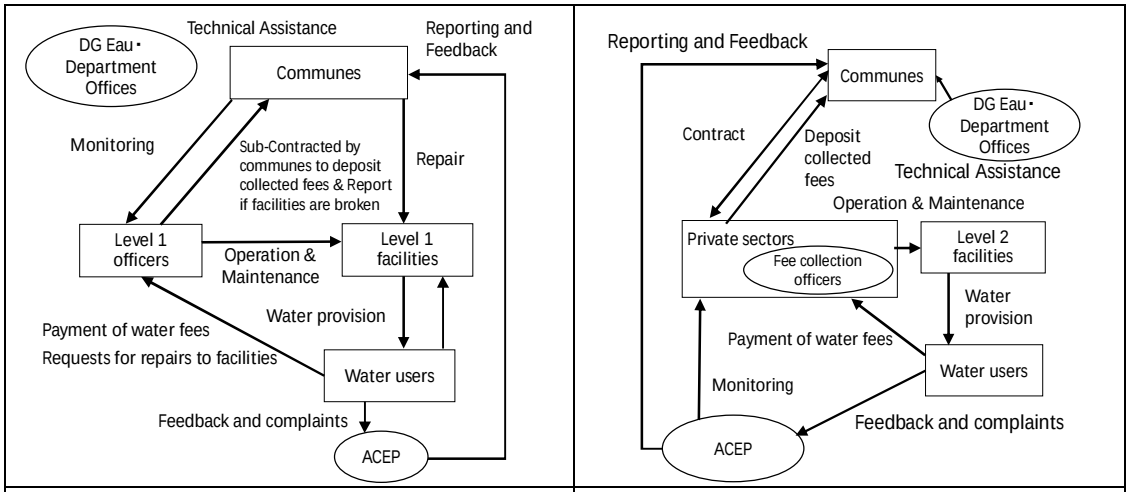
3.5 Sustainability (Rating:②)

3.5.1 Institutional Aspects of Operation and Maintenance

Based on the guideline for communes newly formulated by the Central Government of Benin in December 2008, the prime O&M roles and responsibilities for water supply facilities have shifted from the Central Government to the communes, which are local administrative

governments[21].

During the ex-post evaluation, it was confirmed that the communes play the central role in O&M for both Level 1 and Level 2 facilities. The O&M framework during the ex-post evaluation is shown in Figure 3.



Source: Results of the interviews with DG Eau, the communes, and the beneficiaries

Note: ACEP stands for Water User Rights Unions in English

Figure 3 Operational and Management System for Level 1 (left) and Level 2 (right)

Following are the roles and responsibilities of each stakeholder/actor related to the O&M for Level 1 and Level 2 water facilities.

3.5.1.1 Level 1 Water Facilities

< Communes >

During the project planning stage, it was agreed that the roles and responsibilities of the communes would include the regular monitoring of the O&M of the Level 1 water facilities. The roles changed, however, during the ex-post evaluation, the commune played a major role in the O&M of the water facilities together with the Level 1 officers elected from water users (villagers).

The communes collect water fees collected by the Level 1 officers from water users and the Level 1 officers receive salary from the communes according to their contracts. Salary paid to the officers is sourced from the collected water fees. The rest of the water fees are

[21] O&M water facilities were transferred from the Central Government to the communes in September 2006 to enable DG Eau to implement a decentralization policy along with the national structural adjustment plan. The roles and responsibilities are described in "Decree No.2006-461 issued on September 7, 2006." DG Eau manages the water resources and formulates a national strategic paper concerning the provision of drinking water and treatment of sewage and effluent, with the cooperation of other related agencies. DG Eau also manages the activities mentioned.

used to purchase spare parts, cover repairs, and cover other running costs of the water facilities.

During the period between the project completion and the ex-post evaluation, 82% of the communities[22] were found to have handled water facility failures properly when they occurred. However, as some water facilities were not properly maintained by communes, it was observed that those water facilities were maintained by communities instead of communes. From the interviews with the DG Eau and Service Eau[23] in the five targeted departments, as to Level 1, the Level 1 officers are assigned in each Level 1 water facility and roles and responsibilities of O&M facilities including monitoring are intend to transfer to communes for the future. However, due to a lack of inappropriate personnel or budgets, some of the communes were unable to conduct monitoring regularly and appropriately. The communes facing these problems with O&M firstly need to again recognize their roles and responsibilities in the O&M of their water facilities and then discuss a better and more workable framework for O&M with the residents.

＜Level 1 officers＞

While Level 1 officers were not placed during the project planning stage, it is confirmed that Level 1 officers were selected among the communities and contracted individually with communes on the O&M of water facilities during the ex-post evaluation. The major roles for Level 1 officers are to sell water, collect water fees and pay them to the communes. Some of the Level 1 officers collect water fees whenever water users use water. Others prepare account books and collect water fees on a weekly or monthly basis. The Level 1 officers presumably have a heightened awareness of the importance of collecting water fees, as their own salaries are paid with the fees collected.

< Water users (Community villagers) >

Some officers at Level 1 water facilities in some of the communities formerly had contracts for O&M with the communes, but the communities took up this responsibility because the communes failed to deal with problems arising in facility O&M. Communities that operate and maintain the facilities without commune intervention do not collect water fees from users. Instead they collect necessary repair fees from water users when repairs are needed and purchase spare parts and hire engineers in their networks with the collected money.

[22] 18 out of 22 communities managed by communes where the 1st field study was conducted
[23] Local administrative offices of DG Eau

3.5.1.2 Level 2 Water Facilities

＜Communes＞

During the project planning stage, the Level 2 water facilities were operated and maintained by AUE (Association des utilisateurs d'eau, Water Users Association in English), a body organized by the beneficiaries. However, the water fee collection and financial management system did not function as well as planned and was later replaced by a new framework under which the communes and private firms signed all-in-one contracts where private firms took responsibility for the fee collection and also operated and maintained water facilities. The firms now pay the communes per $1m^3$ of water used as agreed in the contract. The communes pool the fees paid by private firms when a large-scale repair or the purchase of generators for the water facilities is required. During the ex-post evaluation, the same O&M framework was observed for the Level 2 facilities.

<Private firms>

During the project planning stage and the ex-post evaluation, the private firms signed the contracts with the communes on O&M Level 2 facilities. Private firms were generally selected not only by their capacity at O&M, but also by their previous business experiences.

3.5.1.3 Level 1 Water Facilities and Level 2 Water Facilities

＜DG Eau and Service Eau＞

Roles and responsibilities of DG Eau and Service Eau have not changed greatly between the project planning stage and ex-post evaluation: to conduct training for hygiene activities and to provide technical support and advice to the communes. According to Service Eau, at least 1 staff person capable of water facility O&M belongs to each commune and is able to respond to technical problems beyond the capacity of the commune.

< ACEP (Associations des Consommateurs d'Eau Potable, Associations of Potable Water Consumers in English) >

No ACEP was established during the project planning stage, but an ACEP consisting of villagers from surrounding communities (villages) had been set up to monitor the water provision service by the time of the ex-post evaluation. If any issues arose they would communicate to the communes and Service Eau. In some villages where no ACEP had been established, villagers would report any emerging issues to the ACEP at the district level[24]. An ACEP is a voluntary entity/unity and there is no obligation to perform ACEP activities.

[24] The administrative levels in Benin are commune, district, and village (community), in descending order.

< AUE (Association des utilisateurs d'eau, Water users association in English) >

During the project planning stage, the Level 1 facilities were operated and maintained by the AUE. The O&M of Level 2 facilities was not operating or functioning well, and its roles and responsibilities had already shifted from the AUE to the private firms. During the ex-post evaluation, the AUE was found to have discontinued operating for both Level 1 and Level 2 facilities.

Regarding the institutional aspects of O&M framework, while there seemed to be problems/issues with the role of the communes in Level 1 facilities, there was no problem/issue observed for the Level 2 facilities.

3.5.2 Technical Aspects of Operation and Maintenance

3.5.2.1 Level 1 Facilities

During the project planning stage, the O&M for the Level 1 facilities was handled mainly by the AUE with technical support from Service Eau, but the AUE lacked sufficient experience and knowledge in the O&M of water facilities. During the ex-post evaluation, the AUE was no longer operating. When repairs were required, the Level 1 officers sent requests to the communes. Then, engineers who had been trained to a certain standard by the communes were sent to do the repairs. In this way, the standard of skills for O&M was maintained properly.

In the villages where contracts with communes had been cancelled and the O&M of facilities was conducted by the communities themselves, there were cases that engineers who had not been trained or engaged by the communes were requested to repair the water facilities when repairs were necessary. Namely, those engineers who are requested to repair facilities by communities are not necessarily having a certain level of skills and being skillful to maintain properly the facilities developed by the Project. As mentioned above, there remain concerns whether the water facilities will be properly and appropriately operated and maintained by the communities alone in the future. However, according to results of the beneficiary survey and the 1st field study, the communities where the contracts with the communes had been canceled dealt with repairs successfully over the period between the project completion and the ex-post evaluation.

3.5.2.2 Level 2 Facilities

During the ex-post evaluation, the private firms contracted to do the O&M with communes received technical training and advice from the communes, DG Eau, and other donors. Therefore, there was no doubt that those private firms had sufficient skills to engage in O&M appropriately for Level 2 facilities. The interviews with the communes and

private firms confirmed that these private firms have appointed staff in each water facility who collect water fees from villagers. If any problem is confirmed to arise in the facilities, the staff will contact the private firms to ensure that the water facility is repaired by skilled private firms. Furthermore, training on water facility O&M for ACEP members is being conducted by Service Eau. The knowledge on O&M the ACEP members absorb will contribute to ACEP's ability to inform the communes of the accurate information collected by the communities.

Regarding O&M skills, there is concern about the appropriateness of the O&M at some of the Level 1 facilities because engineers not equipped with the skills required by communes are sometimes placed for repairing water facilities by communities.

3.5.3 Financial Aspects for O&M

It is agreed that water fees collected from water users are used to cover necessary expenses for the O&M of water facilities. Current water fees are different for Level 1 facilities and Level 2 facilities but the interview with DG Eau revealed that a plan for nationally unified water fees is being examined. The timing of that is yet to be decided. Details of the financial status of water facilities are shown below.

3.5.3.1 Level 1 Facilities

During the project planning stage, it was estimated that water fees of 10F.CFA per unit (30 liter tub) would have to be collected. During the ex-post evaluation, the same amount was charged as water fees. In the beneficiary survey, 99.5% of the respondents (240 out of 241) answered that they were "satisfied with the water fees." The price is clearly not too high for their budgets. Note that the water fees differ slightly according to the size of measuring tub or the size of the communities (water user population).

During the ex-post evaluation, it was observed that the water fees collected were used for the salaries of the Level 1 officers and for covering the costs for necessary repairs. A necessary repair cost when problems arise are covered by costs collected and paid by Level 1 officers to communes. While water fees are monthly paid to communes and pooled for the O&M of water facilities in 18 of 22 communities[25] visited by the 1st field study, water fees were not regularly collected or pooled in the 4 other communities because Level 1 officers were appropriately placed in facilities. When repairs were needed in the villages that had failed to save fees, the commune could temporarily supplement the repair fees. In some

[25] Twenty-five villages (communities) were visited in the 1st field study. Facilities in 3 out of 25 were operated and maintained by communities. Therefore, 22 villages (communities) operated and maintained by communes were recognized as the total villages (communities) analyzed.

cases, however, the repairs were left undone due to financial constraints in the respective communes. One possible reason for this was the transfer of the facility management role from DG Eau to communes that had failed to secure budgets to play this role. The situation is apparently transitional, however, from the 1st field study, it was confirmed that the communes were aware of the need to secure budget to cover additional costs for monitoring and purchasing spare parts, etc. Budget planning is gradually improving. In three villages where villagers themselves operated and maintained the water facilities without relying on the communes, the water fees were not collected and no money was paid to the communes.

3.5.3.2 Level 2 Facilities

During the project planning stage, it was estimated that fees of 30F.CFA per unit (30 liter tub) would be necessary, and the same amount was actually charged as water fees during the ex-post evaluation. Note that the water fees differ slightly according to the size of the measuring tub or the running cost (for generator or commercial electricity). During the ex-post evaluation, the water fees collected were used/distributed for the following purposes: 1. Salary to the fee collection officers deployed by private firms, 2. O&M savings in case of facility breakdown, 3. Payments to the communes, and 4. Profits to private firms. The water fees collected every month varied, so the allocated amounts would vary as well. There is no financial problem in exchanging spare parts, and when generators need repairs the work is done not only by private firms, but also through financial support from the communes and DG Eau. It was observed that 9 out of 10 Level 2 facilities had been collecting water fees without any issues. One Level 2 facility, however, failed to collect water fees due to user complaints about the amount of water fees.

There were some concerns over the financial aspects of O&M for Level 1 facilities. There were some communities that had established their own O&M systems (3 out of 25 communities) and others that did not pay the communes (4 out of 25 communities). They are not saving enough to sustainably operate and maintain their water facilities, so they may fail to repair the facilities due to lack of money for repairs. There was a case when a facility needed repair and the commune temporarily supplemented the repair fees for the community. However, temporal financial issues are confirmed in communes that were unable to respond to the recent transfer of the facility management role from DG Eau to the communes. Moreover, as water users in 1 facility out of the Level 2 facilities have many grievances against water fees, water fees have not been appropriately collected. This is considered a problem for the sustainability of the water facilities. If major facility repairs are needed, a lack of maintenance and repair budget might be a crucial issue. There is an urgent need for discussion between the communities and communes, but first the communes

need to explain about water fees and persuade the communities to agree to water fees to be newly established (keeping in mind that the Benin Government is planning to unify the fees). When the water fees are unified nationally and the communities agree to pay through discussion on the water fees with the communes, it is very possible that maintenance costs can be secured for the repair of water facilities in the future.

3.5.4 Current Status of Operation and Maintenance

As was noted in "3.3 Effectiveness, 3.3.1.1 Operation Indicators," the operational rates for Level 1 and Level 2 are 83.1% and 100%, respectively.

3.5.4.1 Level 1 Facilities

According to the 1st field visit, the results of the beneficiary survey, and telephone interviews with the communes, 103 out of 124 facilities (Level 1) were handling O&M very well and the facilities were in good operational condition.

On the other hand, 21 facilities were not operational. The major reasons for this are: the communes have not conducted appropriate monitoring; lack of communication from Level 1 officers to the communes; delays in responding by the communes; lack of budget for repair due the embezzlement of collected water fees by some Level 1 officers.

Out of these 21 communities, 16 had identified the breakdown problem properly and promptly communicated them to the communes and were still waiting for repairs. On the other hand, it is confirmed that when water facility problems arose in the remaining 5 communities, both the communes and Level 1 officers were unable to respond to the problems appropriately. It is clear that the level of capacity and awareness on O&M amongst communities and communes varies.

As a result of the implementation of soft components, training in hygiene awareness and technical skills for monitoring has been conducted for the communes by DG Eau and other donors. When the facilities have breakdowns, Level 1 officers contracted with the communes directly inform the communes of the breakdown so that the communes can arrange engineers for repairs. In regard to changing spare parts, some tiny repairs are done by the Level 1 officers and other repairs requiring higher skills are handled by the communes, depending on the parts and the cost. The details are agreed in writing in their contracts.

3.5.4.2 Level 2 Facilities

It is confirmed that technical training for the private firms that deal with the O&M of 10 Level 2 facilities was conducted by DG Eau and Service Eau. The private firms agreed to submit monthly reports on the O&M and pay the collected fees to the communes.

The following summarizes the progress made in solving some of the problems that arose during the project completion

- Spare parts, including generators, can be purchased at the central town of each department or Cotonou.
- Although the budgets for monitoring staff and activities apart from the general budgets were not secured appropriately by Service Eau, but at least 1 staff person who conducts the educational activities and budget were secured for O&M water facilities.
- As a result of hygiene awareness training conducted by the communes, people's awareness about hygiene has been elevated and the hygiene environment has improved.

As mentioned above, most of the O&M for Level 1 facilities was progressing well without major problems during the ex-post evaluation, but some Level 1 facilities were non-operational. Problems arose, because some of the communes and Level 1 officers were not properly performing their roles or meeting their responsibilities. There were no O&M issues raised for the Level 2 facilities apart from one facility where the water users were unwilling to pay the water fees.

Some minor problems have been observed in the institutional, technical, financial and current status of operation and maintenance of the water facilities. Therefore, the sustainability of the project effects is rated as fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to increase the number of people with reliable access to safe water in the five targeted departments in rural Benin (Collines, Zou, Couffo, Mono and Ouémé) by constructing water facilities, and thereby improve the standard of living in these departments. This project has been highly relevant to the Benin's development plan and development needs, as well as Japan's ODA policy, so its relevance is high. The efficiency of both the project cost and project period were within the plan and the efficiency of the Project is high. The ex-post evaluation confirmed that the operational rate of deep wells with hand pumps (hereafter Level 1) and small-scale water supply facilities (hereafter Level 2) developed by the Project has exceeded the 80% target value. Furthermore, it is confirmed the number of people who had access to safe and stable water increased by approximately 89,000. Improvement of hygienic conditions due to the provision of safe water and reductions in water-borne diseases and water-fetching labor were confirmed as positive impacts, resulting in improved school enrollment rates and an improved standard of living amongst women. Accordingly, the effectiveness and impacts are high. The operational rate for water facilities is very high (83.1%

for Level 1 and 100% for Level 2), and it is summarized that almost all of these facilities are properly maintained. However, small problems were observed in operation and maintenance (hereafter O&M) with regard to the institutional, technical, and financial aspects for Level 1, and to the financial aspect for Level 2. There is clearly still room for the Government of Benin to improve the capacity to manage the facilities, and thus the sustainability of the effect is rated as fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

One of the Level 2 facilities has a financial concern because water fees were not collected as planned due to user dissatisfaction with the increased water fees. The implementing agency is in a position to set the water fees, so it is recommended that the implementing agency work with the communes to identify the cause of the failure to collect water fees. The appropriate water fees water users are willing to pay should be examined together with communes. Water fees that are to be revised should be determined based on the result of the verification. The implementing agency needs to analyze the results of monitoring conducted by the communes to verify the relevance of the new water fees.

4.2.2 Recommendations to the Communes

Issues and concerns on inappropriate water facility O&M, such as delays in the commune responses when problems arise, appropriate deficiency management of water fees collected, and insufficient timely communication with the communes were confirmed in some communities. These issues and concerns can be attributed to a failure by the communes to fulfill their O&M roles and responsibilities due to a lack of necessary staff and budget. Thus, the communes need to secure budgets and allocate staff appropriately to improve the current O&M status and framework. Eventually, the O&M framework and status are expected to be established as planned. Water is essential for everyday life: when a facility breaks down, urgent responses by the communes are mandatory.

In addition, as was mentioned in the recommendations for the implementing agency, one of the Level 2 facilities has an issue with collecting water fees from water users due to user complaints about the water fees. The commune needs to explain the water fees to the users and persuade them to pay them, keeping in mind that the Benin Government is planning to unify the fees in the future.

4.2.3 Recommendations to JICA

None.

4.3 Lessons Learned

High operational rate of the water facilities by adopting a functional O&M framework

During the ex-post evaluation, the operational rate of water facilities reached 83.1% for Level 1 and 100% for Level 2. One of the factors encouraging the boosting of the rate to more than 80% is classification of the roles and responsibilities of each stakeholder. This contributed to the proper functioning of the O&M framework. For example, due to the promotion of national decentralization in Benin, the O&M framework for the water facilities has been reviewed and the communes have played major roles in the O&M of Level 1 and Level 2 facilities. In Level 1 facilities, each community deals with the daily O&M. When problems beyond the capacity of the communes arise, the DG Eau and Service Eau will provide technical support. Expert and technical knowledge is vital for the O&M of Level 2 facilities. The outsourcing of O&M to private firms who met the levels required by the communes contributed to the 100% operational rate reached in Level 2. The communes recognize their role and responsibilities in the O&M framework and clarify the responsibilities and role-sharing between the stakeholders. This has helped the O&M framework become operational and functional. The high operational rate of the water facilities was brought about by the adoption of a workable O&M framework reflecting each stakeholder's capacity and skills. Therefore, when similar water supply projects are planned in the future, the stakeholders' roles and capacities should be analyzed during the project planning stages in order to establish workable and practical O&M frameworks with the implementing agencies playing the central role. In light of this, the Project can serve as a good model for future projects.

Response of the implementing agency and JICA when in the government's organizational reform

Due to the process of national decentralization, the major O&M role for the water facilities shifted from DG Eau to the communes during the project implementation. During the ex-post evaluation, among the communes that controlled the non-operated Level 1 facilities (16.9%), it was confirmed that some communes were unable to secure the budgets and staffs necessary for operating and maintaining water facilities due to the decentralization. This is because the communes were not positioned under DG Eau, the implementing agency, when the O&M role shifted from DG Eau to the communes. DG Eau could therefore not intervene to help the communes formulate personnel and budget plans. When the reform of an implementing agency causes the transfer of O&M roles to another agency during a similar case in the future, the implementing agency should support the formulation of O&M plans in order for the new agency to secure appropriate budgets and personnel. When an implementing agency and an agency with roles and responsibilities in water facility O&M are not the same agencies during a transfer of

O&M, the implementing agency should give as much necessary advice as it can for better planning for the O&M. The implementing agency should also push the newly appointed agency to formulate O&M plan and secure the necessary budgets.

During the Project, the project consultant advised the implementing agency that water facility O&M contracts should be concluded between the private firms and communes at an early stage. The consultant, however, did not approach the communes directly regarding this matter. The communes are not in the direct contact with the implementing agency, and the consultant did not have a right to make suggestions directly to the communes. Assuming that implementing agencies are reformed when implementing projects in the future and that advice from implementing agencies and consultants regarding appropriate staff allocation and budgets is necessary for the newly appointed organizations who are to operate and maintain water facilities, the following actions are necessary: in order for the newly appointed organizations to operate and maintain water facilities appropriately, JICA needs to inform the newly appointed organizations about the significance of cooperation between the Government of Japan and the government of the recipient country, and also thoroughly explain the roles and responsibilities involved in the O&M of water facilities; and moreover, JICA should recommend the newly appointed organizations to get exact advice concerning the plan of O&M facilities from an implementing agency or consultant where necessary.

(End)