

Republic of Kenya

FY 2015 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Improvement of the Water Supply System in Embu and the Surrounding Area”

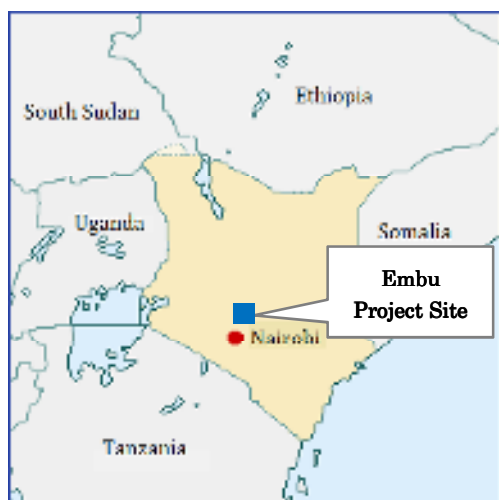
External Evaluator: Yukiko Sueyoshi, Global Link Management Inc.

## 0. Summary

This project was conducted in Embu city and the surrounding area of Kenya to supply safe water stably to the residents by expanding a water treatment plant and by constructing water distribution pipes. The relevance of the project is high, because the project was consistent with the development policy of Kenya and needs of the target area both at times of the project planning and the ex-post evaluation and with Japan's assistance policy at the time of planning. The efficiency is fair as the project outputs were completed almost as planned and the project cost was within the plan, although the project period was far longer than the plan because construction of distribution pipes by the Kenyan side was delayed. Implementation of the project brought positive effects including increase of water service connections, water revenue, and water supply amount as well as improvement of water supply hours. In addition, some positive impacts such as reduction of water borne diseases and water fetching labor were observed. Therefore, effectiveness and impact of the project are high. The facilities and the equipment were maintained as appropriate and no major issues were observed in the institutional and technical aspects of Embu Water and Sanitation Company (EWASCO). On the other hand, some issues remain to be improved in the financial aspect, thus the sustainability is deemed fair.

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

## 1. Project Description



Project Location



Mukangu Water Treatment Plant Constructed by the Project

## 1.1 Background

Embu is a provincial city with a population of around 60,000 (as of 2007), located around 100 km northeast of the capital Nairobi. At the time of the planning, EWASCO was supplying water to an area of 933km<sup>2</sup> including Embu and the surrounding areas such as Gachoka district and part of Nembure district. EWASCO suffered from low water supply rate because of several issues. The issues included capacity shortages of its intake facilities and water treatment plant, an inadequate distribution pipe network and aging of distribution pipes. The people who could not receive the water supply service depended on unsanitary sources such as streams and puddles of rainwater for their domestic water, contributing to the spread of water-borne diseases. Thus, there was an urgent need to supply safe water to Embu and the surrounding areas.

Under these circumstances, in June 2006, Kenya's Ministry of Water and Irrigation (MWI) requested to the Japanese government for a grant aid project to develop water supply and sewage facilities in Embu city. In response to the request, a preparatory study was carried out to assess population dynamics of the target sites and to determine priorities of the cooperation in August 2008. In addition, based on the issues determined by the preparatory study, a basic design study was implemented to formulate a more suitable design and project plan in September 2009. Final decisions were then made about the cooperation component of the project.

## 1.2 Project Outline

The project aimed to increase access to safe water by upgrading and constructing water supply facilities, thereby contributing to improvement of residents' living conditions in Embu and the surrounding areas.

<Grant Aid Project>

E/N Grant Limit or G/A Grant Amount / Actual Grant Amount	2,560 million yen • 2,560 million yen /2,285 million yen
Exchange of Notes Date /Grant Agreement Date	July, 2010 / July, 2010
Implementing Agency	Tana Water Services Board Embu Water and Sanitation Company (EWASCO)
Project Completion Date	December, 2012(completion of construction and procurement by Japanese side) February, 2013(completion of soft components)
Main Contractor	KONOIKE Construction Co., Ltd
Main Consultant	NJS Consultants Co., Ltd
Preparatory Study	August, 2008
Basic Design Study	September, 2009
Related Projects	The Project for Management of Non-Revenue Water (2010-2014) Japan Overseas Cooperation Volunteer (water quality examination :2010-2012) Senior Volunteer (maintenance of water treatment plant:2014-2016)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator<sup>1</sup>

Yukiko Sueyoshi, 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 – November, 2016

Duration of the Field Study: February 11, 2016 – February 22, 2016

May 30, 2016 – June 6, 2016

## 3. Results of the Evaluation (Overall Rating: B<sup>2</sup>)

### 3.1 Relevance (Rating: ③<sup>3</sup>)

#### 3.1.1 Relevance to the Development Plan of Kenya

“Vision 2030,” a national strategy of Kenya at the time of the planning, contained a section on Water and Sanitation, stating “Kenya is a nation with scarce water resources, and a high-quality water supply is essential for economic and social development. Vision 2030 aims to provide a safe water and improve sanitation for everyone in Kenya.” “The National Water

<sup>1</sup> This ex-post evaluation was carried out by referring to views of an expert on water service (former staff of Bureau of Waterworks Tokyo Metropolitan Government), referring as to ‘External Adviser’ in this evaluation report. Selection of the expert was done by the external evaluator.

<sup>2</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>3</sup> ③: High, ②:Fair, ①:Low

Resources Management Strategy 2007-2009”, Kenya’s water sector strategy, also described measures to ensure fair access to water resources and sustainable and efficient water usage in order to eradicate poverty through provision of sufficient water for drinking and industry.

At the time of the ex-post evaluation, there were no changes to “Vision 2030.” According to the “Second Medium Term Plan 2013-2017,” the medium-term plan under the above vision, people who were receiving piped water supply services was still only 27.9%<sup>4</sup> of the national population. Also, the plan set a goal to improve and expand water facilities as one of the policy objectives. The Kenyan water sector’s strategy is currently under revision following an amendment to the Water Act.

Therefore, the project’s purpose to improve water supply services has been consistent with Kenya’s development policies from the planning to the ex-post evaluation.

### 3.1.2 Relevance to the Development Needs of Kenya

At the time of the planning, the population in the target areas of this project, Embu and the surrounding areas (the Gachoka district and part of the Nembure district), was estimated to be around 171,000 (as of 2009). Among them, only around 69,000 people (41% of the population) living near some arterial roads had water supply. Reasons for this low water supply rate included insufficient volume of raw water, capacity shortages at existing water treatment plants, inadequate distribution pipe networks, and aging of distribution pipe networks built over 40 years ago. Water demand in Embu city was expected to grow due to increase of the population moving from rural areas. Therefore, it was an urgent issue to ensure a safe and steady water supply.

By the time of the ex-post evaluation, the target area of this project had become a part of Embu County due to a restructuring of political jurisdictions in 2013. In 2014, the water supply rate of Embu County was estimated to be about 45% and many people were still using untreated water from sources such as ponds and rivers<sup>5</sup>. The completion of this project saw a major improvement in services in EWASCO’s water supply area (see 3.3 Effectiveness for details). By the time of the ex-post evaluation, EWASCO’s water supply area had been expanded from 933km<sup>2</sup> at the time of the planning to about 1,200km<sup>2</sup>. With the expected population growth in coming years, it is important that new water resources be secured and the water supply facilities be expanded.

As seen above, the project has been consistent with the need of the target area from the planning to the ex-post evaluation.

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<sup>4</sup> The number was calculated based on the 2009 Kenya Population and Housing Census.

<sup>5</sup> Source: EMBU COUNTY INTEGRATED DEVELOPMENT PLAN 2013-2018 (April,2014)

### 3.1.3 Relevance to Japan's ODA Policy

At the time of the planning, the “Country Assistance Program for Kenya,” Japan’s aid policy formulated in 2000, addressed the development of water supply and sewage facilities under “Environmental Protection,” which was one of the key assistance areas. The Japanese government also stated assistance for “effective management of water resources” and “access to safe water and sanitation facilities” at the Forth Tokyo International Conference on African Development (TICAD<sup>6</sup> IV) in 2008. Therefore, it was confirmed that the project was consistent with Japan’s aid policy and its foreign policy.

### 3.1.4 Relevance to Appropriateness of Project Planning Approach

As stated in “1.1 Background,” the development of water supply and sewage facilities was the initial request from the Kenyan government. Upon assessing priorities of the cooperation components during the preparatory study, it was determined that the development of water supply facilities was the highest-priority. A plan was made in which the Japanese side would expand the water treatment plants and the Kenyan side would develop the distribution pipe network. Then, it was agreed that the Kenyan government would cover 300 million shillings (around 360 million yen)<sup>7</sup>. According to the Kenyan officers, this amount of Kenyan government was not too high and was agreed to be feasible. Therefore, there were no issues in the processes such as the selection of the project scope and the agreement on the cost to be covered by the Kenyan government.

However, the work to extend distribution pipes was delayed significantly. It was expected to complete by 2012 at the planning, but actual completion was May 2016 during the time of the ex-post evaluation. The Japanese and Kenyan officers mentioned that this was caused by a delay in budget allocation by the Kenyan government resulting from policy changes, including an amendment to the Kenyan Constitution to promote decentralization<sup>8</sup> in 2010, revision of the Water Act and water sector reform, and a restructuring of political jurisdictions in 2013.

In light of the above, the project was highly relevant to Kenyan development plan and needs, as well as Japan’s ODA policy. Therefore its relevance is high.

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<sup>6</sup> TICAD stands for Tokyo International Conference on African Development. It is an international conference on development in Africa.

<sup>7</sup> The shilling is Kenya’s currency. One shilling is equivalent to around 1.2 yen (as of October 2009).

<sup>8</sup> A new constitution was approved in August 2010 after a national referendum, with the purpose of alleviating tensions between ethnic groups in Kenya and promoting democratization. Under the old constitution, Kenya was divided into eight provinces that were managed by a central government. The new constitution saw Kenya re-divided into 47 counties, with authority redistributed to governors elected by the citizens of each region. The new government system commenced in March 2013, with around 15% of the central government’s revenue allocated to county governments (from the 2014 Report on the ODA Investigation of World Nations: Kenya).

### 3.2 Efficiency (Rating: ②)

#### 3.2.1 Project Outputs

Under the project, the Japanese government mainly provided support for the rehabilitation and construction of existing intake facilities, water treatment plants, and water distribution facilities. For the water treatment facilities, the new Mukangu Water Treatment Plant 2 (capacity: 11,000m<sup>3</sup> per day) and a clear water reservoir (3,000m<sup>3</sup>) were added to the existing Mukangu Water Treatment Plant 1 (capacity: 10,000m<sup>3</sup> per day). A raw water transmission main running to the reservoir was also constructed. For the water distribution facilities, a new clear water reservoir (6,000m<sup>3</sup>) was added to the existing Kangaru Reservoir, and the procurement<sup>9</sup> and construction<sup>10</sup> of distribution pipes (60.3km and 10.8km respectively) were planned.

Other equipment such as water quality examination equipment, water meter calibrators, and three-ton trucks were also procured, and soft components were put in place to improve the facilities' operation and maintenance techniques. It was agreed that the Kenyan side would construct distribution pipes procured by the Japanese side and extend distribution pipes to the project target areas (the project target area was indicated by the shaded areas in Figure 1).

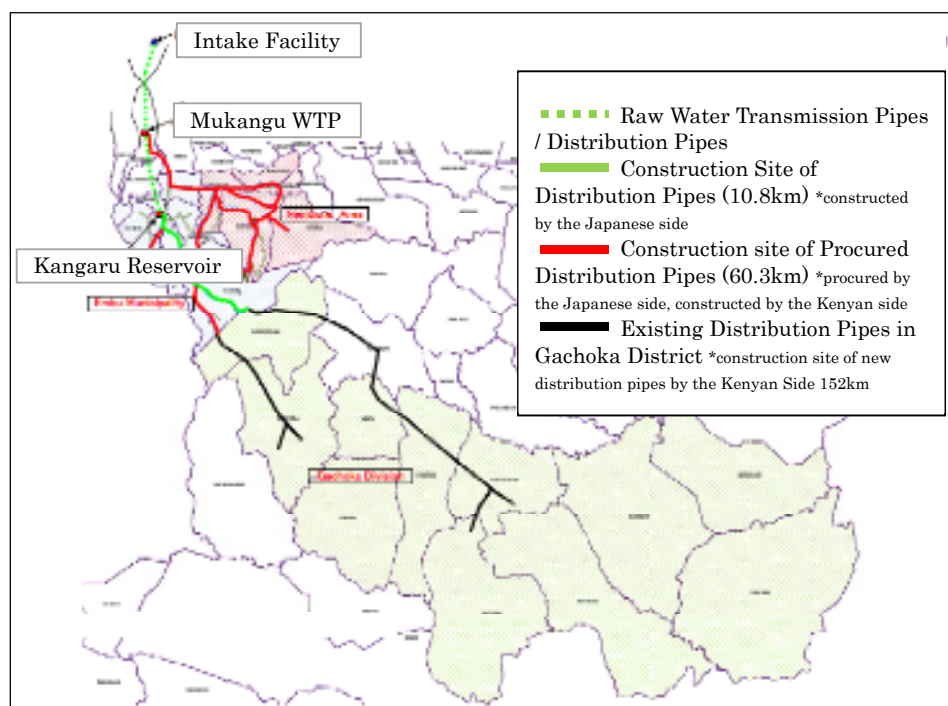


Figure 1 The Project Target Area and Outputs

#### <Japanese Side>

Table 1 shows the Japanese outputs. The rehabilitation of intake facilities, the construction of

<sup>9</sup> These pipes were to be procured by the Japanese contingent and laid by the Kenyan contingent.

<sup>10</sup> These pipes were to be both procured and laid by the Japanese contingent.

new water treatment and distribution facilities, the procurement of equipment and soft components were done by the Japanese side. While minor changes were made to some parts of the outputs, all were carried out almost as planned.

Table 1 Planned and Actual Outputs of Japanese Side

【Rehabilitation】	Planned	Actual
Intake Facilities (one site)	Rehabilitation of Intake Weir and Mouth Installation of Fine Screen Spill Way, Spill Way and Grid Chambers	As Planned
【New Construction】	Planned	Actual
Raw Water Transmission Main	Extension of Raw Water Transmission Main (5.9km)	Changed (construction route of raw water transmission main)
Mukangu Water Treatment Plant (WTP)	WTP Unit 11,000m <sup>3</sup> /day (distribution chambers, receiving tank, grid chambers, rapid filters tanks, elevated tank, sludge lagoon, etc.)	As Planned
Clear Water Transmission Pipe	Construction of Water Transmission Pipe (5.2km)	As Planned
Clear Water reservoirs	Ground-based 6,000 m <sup>3</sup> (In Kangaru Reservoir Site) Ground-based 3,000 m <sup>3</sup> (In Mukangu WTP)	Changed (Additional construction of water transmission and bypass pipes)
Distribution Pipes	Construction of Distribution Pipes (10.8km)	Changed (size of pipes)
【Procurement】	Planned	Actual
Distribution Pipes	Distribution Pipes (60.3km)	Changed (from Japanese pipes to Kenyan pipes)
Calibrator of Water Meter	Calibrator of Water Meter (one unit)	As Planned
Water Analysis Apparatus	Water Analysis Apparatus (one unit)	As Planned
Three Ton Truck	Three Ton Truck (one unit)	As Planned
Portable Super-sonic Flow Meter	Portable Super-sonic Flow Meter	As Planned
【Soft components】	Planned	Actual
Training for Operation and Maintenance of WTP	Two Months	As Planned
Training for Water Quality Control of WTP		

Sources: Document provided by JICA, Questionnaire Survey to EWASCO

#### <Kenyan Side>

Table 2 shows the Kenyan outputs. All of the Kenyan outputs were completed despite delays in some outputs. At the time of the planning, it was agreed that the Kenyan side would extend the distribution pipes by 152 km<sup>11</sup>. Only 122 km was reported in the first field survey of the ex-post evaluation (February 2016), but it was confirmed that 176 km was completed by the

<sup>11</sup> At the time of the planning, there were 152km of distribution pipes in Gachoka. These were constructed over 40 years ago and had begun to deteriorate, causing frequent leakages. The water treatment plant also produced insufficient water, and the water was supplied around two days per week. Therefore, it was planned that new distribution pipes in Gachoka was constructed by the Kenyan side.

time of the second field survey (June 2016). Further extension work is still underway in the project target area, with 21 km currently under construction and another 46 km under the plan.

Table 2 Planned and Actual Outputs of the Kenyan Side

Planned	Actual
Land Acquisition	Completed as planned
Installation of Fence	Delayed due to budget limitation, but completed in February 2013.
Installation of Power Feeder Line	Completed as planned
Construction of Access Road to the Site	Completed as planned
Installation of Distribution Pipes (60.3km)	It was planned that the pipes were procured by the Japanese side and installed by the Kenyan side. The construction was delayed due to budget limitation, but completed in 2013. A part of section (about 10 km) had not been utilized because extension work was not completed, however, water service was started in May 2016 after the water supply test.
Extension of Distribution Pipes (152 km)	Construction was delayed due to budget limitation. To meet the residents requests for extension of distribution pipes, total of 176 km pipes were installed (exceed the planed 152km) and extension works were continuing in the target area at the time of ex-post evaluation. A part of construction section (about 6km) out of 176km was removed due to road construction, however, it was reinstalled by using EWASCO's budget in March 2016.
Demolition of Kangaru Facilities	Completed as planned
Installation of Drainage Pipes at Mukangu WTP 2	Completed as planned
Rehabilitation of Mukangu WTP 1	Delayed due to budget limitation, but completed

Sources : Document provided by JICA, Questionnaire Survey to EWASCO

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Cost

As seen in Table 3, the Japanese side's project cost was within the plan (89% of the plan). The main reason for this was that there was no necessity to utilize the contingency budget<sup>12</sup> that was prepared during the planning. The Kenyan side's project cost, meanwhile, exceeded the plan (104% of the plan), mainly due to high inflation rates that caused increases of equipment prices in Kenya<sup>13</sup>. The total cost of the project was within the plan (90% of the plan).

As seen above, the project cost was within the plan.

<sup>12</sup> It is difficult to make plans based on the matters and conditions anticipated at the time of the exchange of notes, as unforeseen circumstances may occur. A fixed proportion of the project budget is therefore allocated as a line of credit in case extra expenses occur. According to documentation from JICA, 11% of the project's budget was allocated as a contingency budget.

<sup>13</sup> During the course of the project, the Kenyan inflation rate rose from 4% in 2010 to 14% in 2011, and was still at 9% in 2012.



Table 3 Planned and Actual Project Cost (at the time of ex-post evaluation)

	Planned	Actual
Japan	2,560 million yen	2,285 million yen
Kenya	307 million yen <sup>14</sup>	322 million yen <sup>15</sup>
Total Cost	2,867 million yen	2,607 million yen

Sources : Document provided by JICA, Questionnaire Survey to EWASCO

### 3.2.2.2 Project Period

The Japanese outputs were completed within the planned project period (97% of the plan). It was anticipated that the Kenyan outputs would also finish their work within the project period, but the extension of distribution pipes was significantly delayed and was completed in May 2016, the time of the ex-post evaluation (237% of the planned period). The Kenyan construction was delayed because the budget for the construction that was agreed on at the time of planning was not allocated during the project period. This was caused by government policy changes, including an amendment to the Kenyan Constitution to promote decentralization in 2010, changes to the Water Act and a restructuring of political jurisdictions in 2013. Under these circumstances, EWASCO secured funds from aid agencies, financial institutions and local government agencies. The extension of distribution pipes that was agreed on for this project was completed, and further extension work was underway at the time of the ex-post evaluation.

Table 4 Planned and Actual Project Period

	Planned	Actual
Japan	2010, June - 2012, December (31 months)	2010, September - 2013, February (30 months)
Kenya	2010, June - 2012, October (29 months)	2010, September - 2016, May (69 months)

Note: Planned and actual project period of Japanese side is from 'start date of a design study (preparatory study)' to 'completion date of soft component'. Also, planned and actual project period of Kenyan side is from 'start date of a design study (preparatory study)' to 'completion date of construction'.

Sources : Questionnaire Survey to EWASCO, Document provided by JICA

In light of the above, the project cost was within the plan, but the actual project period was far longer than planned, therefore, efficiency of the project is fair.

## 3.3 Effectiveness<sup>16</sup> (Rating: ③)

### 3.3.1 Quantitative Effects(Operation and Effect Indicators)

The following quantitative effect indicators were set in the ex-ante evaluation: an increase of

<sup>14</sup> About 250 million Kenyan Shilling. 1 Kenyan Shilling=about 1.2 yen(Sources: document from JICA)

<sup>15</sup> About 322million Kenyan Shilling. 1 Kenyan Shilling =about 1.0 yen(Sources: Questionnaire Survey to EWASCO )

<sup>16</sup> Sub-rating for Effectiveness is determined with consideration of Impact.

water supplied population from 69,000 people (2009) to 168,000 people (2015)<sup>17</sup>, an increase of water supplied households from 17,750 households (2009) to about 40,000 households (2015)<sup>18</sup> and an increase of water distribution amount<sup>19</sup> from 10,000m<sup>3</sup> per day (2009) to 21,000m<sup>3</sup> per day (2015). However, it was not possible to obtain accurate data on population and households receiving water supply, as EWASCO did not ascertain the number of users per water service connections at the time of the ex-post evaluation. The water supply area was expanded and restructuring of political jurisdictions was made. As a result of these changes, despite attempts to calculate these indicators during the ex-post evaluation, it was determined that the target and actual indicators could not be properly compared because the definitions of these indicators were changed. Therefore, (1) the number of water service connections is used as a substitute indicator for water supplied population and households as this indicator shows the number of EWASCO customers. The target number of water service connections was calculated as follows: First, the average number of water users per connections<sup>20</sup> was calculated to be 8.7 based on the information on the documents prepared at the time of the planning. Then, the target figure of water supplied population for 2015 was recalculated using the actual average-population-growth rate. Finally, this new target figure was divided by the average number of users per connections (8.7) to make a new target of 18,850<sup>21</sup>. In addition, (2) Water Distribution Volume and Facility Usage Rate of the water treatment plant were added to determine the effectiveness of this project. Moreover, (3) Water Supply and Sewage Charge Revenue, (4) Non-Revenue Water Ratio and (5) Water Supply Hours before and after the project were compared for reference<sup>22</sup>.

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<sup>17</sup> The target population to receive a water supply was calculated as 87% of the projected population for 2015 (193,000), a ratio agreed on during the planning stage (193,000 people x 0.87 = 167,910).

<sup>18</sup> The target number of households to receive a water supply was calculated as the target population to receive a water supply divided by 4.2, the average number of people in a local household at the time (167,910 people ÷ 4.2 people in a household = 39,978 households).

<sup>19</sup> Distributed water volume (volume of water leaving treatment plants) = revenue water (supplied water: revenue-earning water) + non-revenue water (leakages, stolen water, etc.)

A target water supply volume of 21,000m<sup>3</sup> per day was set in the ex-ante evaluation. On the other hand, according to the preparatory study report, the intake volume was 23,000m<sup>3</sup> per day and the planned distribution volume was about 21,000m<sup>3</sup> (maximum rated volume of the water treatment plants) for the target year after taking production losses into account. This is used as the “distribution volume” for the purposes of this report.

<sup>20</sup> Number of people receiving a water supply at the time of the planning stage (69,000) ÷ number of water service connections at the time of the planning stage (7,910) = average number of users of each connection (8.7)

<sup>21</sup> At the time of the planning stage, the annual average population growth rate (for the target area of the project) was 1.9%. The actual average population growth rate for Embu County was 1.5%. The target number of people to receive a water supply was recalculated accordingly, producing a new target of 164,000. The target number of water service connections to be connected was then recalculated as follows: Target number of people to receive a water supply (164,000) ÷ average number of users of each connection (8.7) = target number of water service connections to be connected (18,850).

<sup>22</sup> While these were not set as indices in the ex-ante evaluation for this project, they were added as reference information as it was determined that they were important for determining the effects of the project. Estimated figures for the target year (2015) were calculated from documentation at the time of planning. These were then used as targets for comparing the outcome with the situation at the time of the planning stage.

### (1) Number of Water Service Connections

Table 5 shows changes in the number of water service connections. The number of water service connections was broken down into households, businesses, public organizations and water kiosks. While this project expected to increase the number of connections by 10,940 (18,850 in the target year - 7,910 in the baseline year), the actual figure saw an increase of 11,560 by 2015 and met the target (105% of the planned). Official documentation from EWASCO indicated an average number of 8 users per water meter<sup>23</sup> at the time of the ex-post evaluation. If this figure (8 users per water meter) is applied to obtain the number of water meters, the target figure is amended to be 20,500<sup>24</sup>. In which case, this project expected to increase the number of connected water meters by 12,590 (20,500 in the target year - 7,910 in the baseline year), but actually, only 11,560 new meters were added by 2015, making the achievement rate a little over 90% (91% of the planned).

According to EWASCO, the number of connected water meters has increased steadily since the project completion, owing to the smooth operation of the water treatment plant built by the project, secure supply of sufficient water, and continuous efforts to extend distribution pipes by EWASCO.

Table 5 Changes in Connected Water Meters

	Baseline	Target	Actual	Actual	Actual
	2009	2015	2013	2014	2015
	Planned Year	2 Years After the Project Completion	Year of the Project Completion	1 Year After the Project Completion	2 Years After the Project Completion
Household	N.A.	N.A.	14,000	16,100	18,200
Business	N.A.	N.A.	650	700	750
Public Organization	N.A.	N.A.	400	450	480
Water KIOSK	N.A.	N.A.	30	30	40
Total Number of Connections	7,910	18,850	15,080	17,280	19,470
Increased Number After the Project (Total - Baseline)	-	<b>10,940</b>	<b>7,170</b>	<b>9,370</b>	<b>11,560</b>

Source: Data provided by EWASCO

Note: 'Year of the Project Completion' is 2013 when the WTP was fully operated. (Actual completion year of Japanese construction was in December 2012) Kenyan construction had been continued since 2013 and finished in 2016.

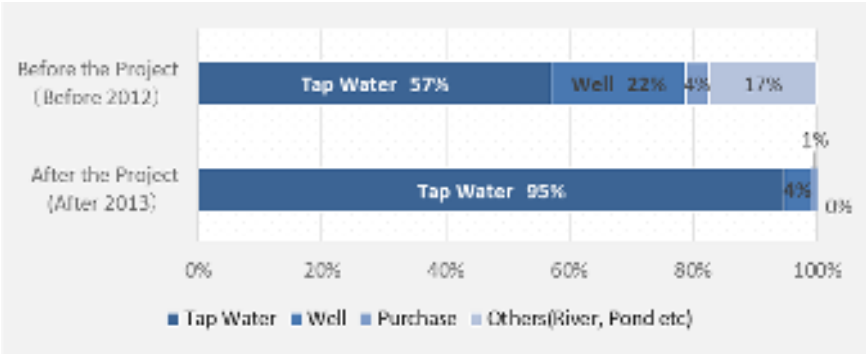
A beneficiary survey<sup>25</sup> was conducted during the ex-post evaluation to investigate how

<sup>23</sup> Managing Director Report to the 7<sup>th</sup> EWASCO Annual General Meeting

<sup>24</sup> Target number of people receiving a water supply (164,000) ÷ number of users of each connection (8) = target number of water meters to be connected (20,500)

<sup>25</sup> For the beneficiary survey, the steps are following: 1) divide the project target area into the residential area of Embu city, business area of Embu city, Nembure district and Gachoka district, 2) to identify about 200 samples, stratified sampling was conducted based on the number of water service connections in each area. For the selection of visited sites, all meter sections were visited in order to avoid bias of regional characteristics (if there were many

water resources had changed before and after the project. As shown in Figure 2, only 57% of residents used tap water before the project, and the others used wells or other water resources (mainly rivers and marshes). By the end of the project, the number of tap water users had increased to 95%. The only residents still using wells were those living in the mountains at the edge of EWASCO’s water supply area.



Source: Beneficiary survey  
 Note: n=207

Figure 2 Changes in Water Sources of Residents

As seen above, the increase in water treatment capacity provided by the Japanese side and the extension of the distribution pipes by EWASCO resulted in an increase in the number of connected water meters that largely met the target. At the time of the ex-post evaluation, further pipeline extensions were underway in and around the target area, indicating that further expansion of the project effects can be expected. The beneficiary survey also showed that the number of population using tap water had increased from around 60% before the project to around 90% afterward.

In conclusion, the number of water meters largely met the target.

(2) Water Distribution Volume and Facility Usage Rate

The water treatment plant capacity was 10,000m<sup>3</sup> per day before the project, and then expanded to 21,000m<sup>3</sup> per day after the project. Figure 3 shows EWASCO’s average annual water distribution volume. The water volume has been increasing since the time the water treatment plant constructed by the project became fully operational in 2013.

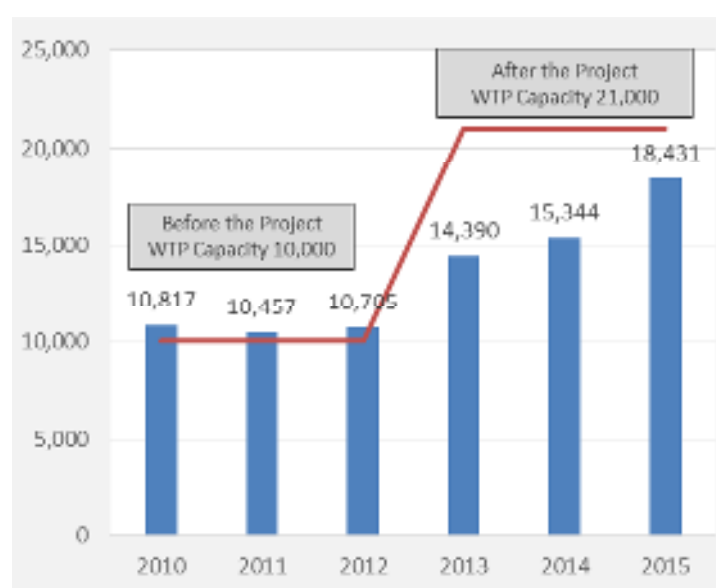
The water treatment plant was overloaded before the project because its utilization rate was

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meter sections in the area, every three sections were visited). Then, local research assistants visited every other houses and asked a person in the house in each meter section. Survey method was an interview-based questionnaire, the sample size was 207, and response rate was 100% (male: 47%, female: 53%/Embu: 50.2%, Nembure: 10%, Gachoka: 37%/households: 64%, businesses: 18%, public organizations: 9%, water kiosks: 5%, no water service connections: 4%). The residents who were not receiving water service from EWASCO were included in the respondent.

over 100% of its capacity. By 2015, this figure had fallen to a reasonable rate of 88%<sup>26</sup>. EWASCO is continuing to extend distribution pipes and replace aging pipes to meet the high demand for water, but it is expected that the current facility capacity will not be sufficient to meet future demand. Thus, EWASCO currently focuses on securing new water resources and reducing non-revenue water. According to the interview to Embu County Government officers, the population in the water supply area and the population actually receiving water services were not accurately assessed at present, and medium- and long-term demand could not be predicted, making it difficult to formulate a future plan for expansion of water supply facilities.

Unit: m<sup>3</sup>/day



Source: Data provided by EWASCO

Note: WTP was completed in December 2012, and fully operated after 2013.

Figure 3 Changes in Average of Annual Water Production Amount

In light of the above, while the capacity of the water treatment plant built by the project will need to be expanded to accommodate growing population, the facilities have been operating with a reasonable utilization rate in the upper range of 80% at the time of the ex-post evaluation.

### (3) Water Supply and Sewage Revenue (Reference)

According to the document at the time of the planning, water supply and sewage revenue was 93.849 million shillings in 2010, and an estimated revenue in 2015 was 271.604 million shillings calculated based on the target water supply volume.<sup>27</sup> On the other hand, the actual

<sup>26</sup> Facility Usage Rate(%)=Annual Water Production Amount÷Water Treatment Capacity×100

<sup>27</sup> Source: Documentation provided by JICA

revenue in 2015 was 235.274 million shillings (89% of the target). According to EWASCO, “The water charge collection rate<sup>28</sup> was only 71% at the time of the ex-post evaluation (February 2016). This is because while public organizations have large amounts of water charge, their payment was delayed in many cases due to budget allocation issues. However, most payments were made in the end. The annual charge collection rate was 95% in 2015 and 96% in 2016 (up to May)<sup>29</sup>.” EWASCO has thorough penalties for missed or late payments – which mainly come from households – and this has improved the collection rate. Also, the water charges were increased at the time of the ex-post evaluation in March 2016.<sup>30</sup> It is expected that these countermeasures will help to increase water revenue in future.

Table 6 Planned and Actual Water and Sewage Revenue of EWASCO

Unit: Thousand Kenyan Shillings

	Baseline 2009  Planned Year	Target 2015  2 Years After the Project Completion	Actual 2013  Year of the Project Completion	Actual 2014  1 Year After the Project Completion	Actual 2015  2 Years After the Project Completion
Water Supply and Sewage Revenue	89,294	271,604	158,685	208,230	235,274

Sources : Document provided by JICA, Data provided by EWASCO

In light of the above, EWASCO’s revenues from water supply and sewage charges increased continuously since the completion of the project, and the actual revenue was around 90% of the planned revenue anticipated during the planning stage. Water charges also increased and collecting operations improved by the time of the ex-post evaluation. As a result, the revenue is expected to continue increasing in future.

#### (4) Non-Revenue Water Rate (Reference)

Table 7 Changes in Non-Revenue Water Ratio

	Baseline 2009  Planned Year	Target 2015  2 Years After the Project Completion	Actual 2013  Year of the Project Completion	Actual 2014  1 Year After the Project Completion	Actual 2015  2 Years After the Project Completion
Non-Revenue Water Ratio (%)	56	25	33	49	40

Source: Data provided by EWASCO

<sup>28</sup> The ratio of water charges that were actually paid.

<sup>29</sup> The national average was 93% (source: A Performance Review of Kenya’s Water Services Sector 2013 – 2014, Water Services Regulatory Board)

<sup>30</sup> The unit price of water differs depending on the number of cubic meters used, but in general, water charges for households increased and those for businesses and public organizations decreased. For example, the price of the minimum unit, 20m<sup>3</sup>, increased from 200 to 220 shillings, while the maximum unit, 300m<sup>3</sup>, decreased from 26,850 to 23,238 shillings.

According to the document at the time of the planning<sup>31</sup>, EWASCO's non-revenue water rate was 56% then, and it was expected to reduce to 25%<sup>32</sup> after the construction of new distribution pipes by EWASCO. The rate was 33% in 2013 at the completion of the project, but it increased to 49% in 2014. This is because the increase of water leakage caused by high water pressure. After the project completion, EWASCO upgraded their water pipes, then the non-revenue water rate reduced to 40% in 2015. While this was below Kenya's 2015 national average of 42%, it was far above the 25% expected during the planning. It indicates that there was room for improvement for non-revenue water reduction.

According to the interview to EWASCO officers, the main causes of non-revenue water in the surrounding areas of Embu city were:

- 1) Bursting of distribution pipes due to an inappropriate adjustment of water pressure in areas with a higher elevation than other areas
- 2) A rise in illegal connections for irrigation during water shortages in the dry season
- 3) Leakages from aging water pipes
- 4) Measurement errors due to meter malfunctions

Under the project, equipment for reducing non-revenue water (flow meters and water meter examination equipment) was provided and pressure regulation tanks to adjust the water pressure were installed. Also, JICA's technical assistance 'Project for Management of Non-Revenue Water' was implemented to provide support in reducing non-revenue water. However, this assistance did not plan sufficiently in reducing non-revenue ratio throughout the target area of the project as its main purpose was to strengthen measures against non-revenue water on a national level. It was expected that EWASCO make efforts in reducing non-revenue water by themselves. External advisors pointed out that when expanding water supply facilities, it was important to include measures for reducing non-revenue water in the plan to enable a steady water supply service and help to improve the operations of the water company.

#### (5) Water Supply Hours<sup>33</sup> (Reference)

As shown in Table 8, water supply hours from the water treatment plant were less than 20 hours per day before the project. From the project completion in 2013, water was provided continuously 24 hours per day. This is because sufficient water was secured in the supply area

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<sup>31</sup> Source: Documentation provided by JICA

<sup>32</sup> At the time of the planning stage, the revenue water rate of EWASCO's 63 km of existing distribution pipes was 44 %. The project aimed to add another 71 km of distribution pipes and increase the revenue water rate to 100%. Calculation results indicated a revenue water rate of around 75% in the target year  $(63 \times 0.44 + 71 \times 1.0) / 134 = 0.74$ , meaning that the non-revenue water rate was 25%.

<sup>33</sup> Technically, "water supply hours" refers only to the hours during which users receive water, while "water distribution hours" refers to the hours during which water is distributed from the water treatment plant. However, "water supply hours" is used to refer to both in this report as this is how the term was used in documentation during the planning stage of this project.

and because new clear water reservoirs were built by the project. Around 9,000 m<sup>2</sup> of clear water reservoirs were added in addition to the existing about 2,400 m<sup>2</sup>, making it possible to secure around 12 hours of clear water.

Also, the project provided soft components on operation of water facilities including treatment plant management. The officers learned how to operate each facility and troubleshooting techniques. By the time of the ex-post evaluation, the officers had mastered these operations and were properly operating, maintaining and managing facilities such as the water treatment plants. This enabled 24-hour water supply.

Table 8 Water Supply Hours from Mukangu WTP

Unit : Hours/day

	Baseline 2009 Planned Year	Target 2015 2 Years After the Project Completion	Actual 2013 Year of the Project Completion	Actual 2014 1 Year After the Project Completion	Actual 2015 2 Years After the Project Completion
Water Supply Hours	>20	N.A.	24	24	24

Source: Data provided by EWASCO

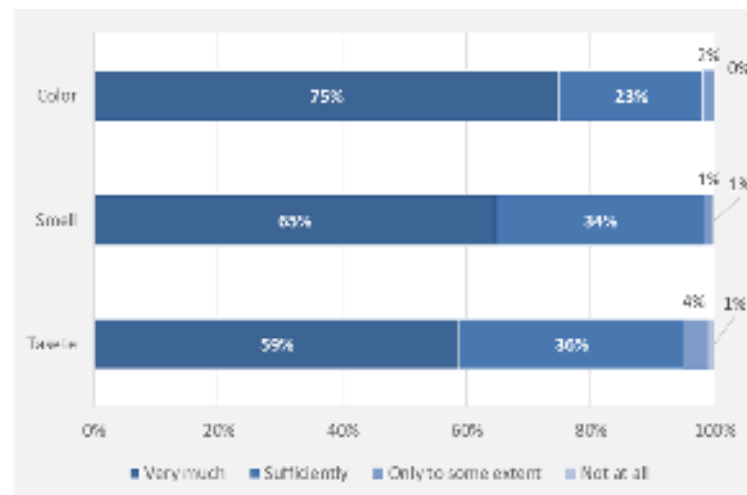
The beneficiary survey also confirmed the supply hours at the water user level before and after the project. As a result, the most common answer for supply hours per day before the project was “less than 6 hours” (35%). After the project, the most common answer was “24 hours” (72%). Residents living near the edges of the water supply area tended to reply that they only received water for around 20 hours per day due to low water pressure or water being cut off temporarily, but a significant improvement was seen overall.

### 3.3.2 Quantitative Effects( Another Effects)

Another effect confirmed by this evaluation was the improvement in water quality. Every month, water quality at three locations, namely, an intake plant, a treatment plant and water supplies at the edge of the area is tested in a laboratory set up in the treatment plant. According to EWASCO, only the water temperature, turbidity and residual chlorine had been measured before the project due to limited water quality examination equipment. However, the water quality analysis equipment and soft components provided by the project enabled water quality monitoring in line with the Kenyan water quality standards. At the time of the ex-post evaluation, the document review of water quality monitoring reports for the past year was done and confirmed that all water quality inspection items had met each standard. According to the water quality inspection at the time of the project planning, escherichia coli was found in the water serviced areas. However, those pathogenic bacteria such as escherichia coli, salmonella, and staphylococcus aureus were not found at the time of November 2015. Figure



4 shows the change in water quality according to the results of the beneficiary survey. When asked about improvements in the color, odor and taste of the water after the project, over 90% of respondents said that they had seen a “significant improvement” or “sufficient improvement”. These results make it clear that water quality has improved.



Source: Beneficiary survey

Note: n=198 (Removed 9 person who don't receive the water service of EWASCO from total respondents)

The data in the figure is rounded off

Figure 4 Improvement of Water Quality

In light of the above, it can be concluded that planned effects were largely achieved, therefore, the effectiveness of the project is high.

### 3.4 Impacts

#### 3.4.1 Intended Impacts

##### 1) Reducing the labor of fetching water

According to the document at the time of the planning, fetching water was heavy burden especially on women and children. In the beneficiary survey, 45% of the respondents receiving water supply services from EWASCO (n=198) said that they had to fetch water before the project. The tendency of the response was same in men and women but different among the regions. Especially, more residents fetched water in the areas outside Embu city. After the project completion, the number of respondents who had to fetch water had fallen to 10%. At the time of the ex-post evaluation, there were around 40 water kiosks in mountainous areas where it was difficult to connect a meter for each household. For these households, villagers now walk from their homes to the water kiosks to fetch water. According to the villages visited during the field survey, positive changes such as ‘not having to walk as far as before to fetch water’, ‘being able to obtain more water’, and ‘no

longer needing to fetch water from a river or marsh' were reported.

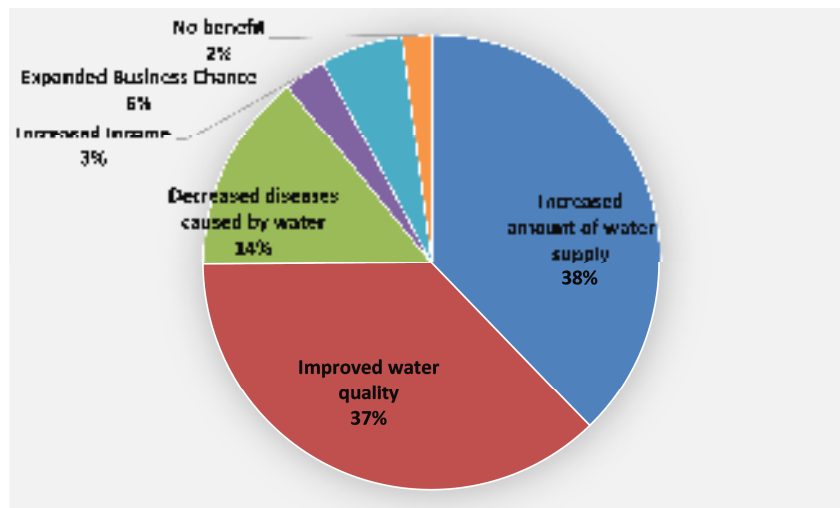
This indicates that the project contributed to reducing the labor of fetching water.

## 2) Reduction of water-borne diseases

Before the project, many residents were dependent on unsanitary water sources such as streams and puddles of rainwater for their domestic water, which caused water-borne diseases. In the beneficiary survey, 66% of respondents said that 'they were affected by water-borne diseases before the project.' While the tendency of the responses was same in men and women, there were obvious regional differences in the results that indicated that the frequency of water-borne diseases was greater among users at the edge of EWASCO's water supply area who used the water kiosks. After the project completion, only 6% answered that 'they were affected by water-borne diseases'. While factors other than the project also contributed to the decrease in water-borne diseases, such as changes in sanitation and nutritional situation, the supply of safe water that meets water quality standards (as described in 3.3.2 Improvement in Water Quality) was one of the major factors.

## 3) Benefits of This Project

As shown in Figure 5, the most common responses to the question, "What are the benefits of this project?" were "A greater volume of water" (38%) and "An improvement in water quality" (37%). The tendency of the response was same in men and women. The regional results indicated that people living at the edge of the water supply area tended to answer "A decrease in water-borne diseases". Also, the results for each customer type, the businesses and public organizations tended to answer "An improvement in income" and "An increase in business opportunities". Specific positive effects were noticed, including "no longer needing to purchase water" and "a larger number of guests at hotels and students as a result of the new running water".



Source: Beneficiary survey

Note: Ratio to the total respond

Figure 5 Benefits of the Project (Multiple Answers)

### 3.4.2 Other Impacts

Sludge and wastewater from the water treatment plant are sun-dried in the water treatment plant before being transported within EWASCO's facilities or to a public treatment plant for proper treatment. The increase of water supply volume has also urged EWASCO to expand its sewage treatment facilities. Expansion of the facilities and network is currently ongoing with support from the World Bank. Thus, no negative impacts on the natural environment had been reported at the time of the ex-post evaluation. Also, land was acquired to build water treatment facilities for the project, but the land owners agreed to the acquisition after being given new lands and houses, so the acquisition was done without a problem.

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.



A stream that used to be used as a water source



Citizens using a communal water meter in a mountainous area

### 3.5 Sustainability (Rating: ②)

#### 3.5.1 Institutional Aspects of Operation and Maintenance

There has been no change in the Kenyan water sector's operational structure from the time of the planning. The MWI makes political decisions and supervises eight Water Service Boards (WSB) in each of eight zones in the country. However, the decentralization that took place from 2013 led to the formation of counties as new administrative zones. The Water Act was revised according to the new system, making this a transition period for Kenya's water sector. Under the new Water Act, water service providers are supervised by their county, but no clear conclusion has been reached about how assets are to be transferred or how profits are to be shared. Despite of the transition period, EWASCO has built a good relationship with the Embu County government, and the county budget has been used such as constructing distribution pipes. Therefore, there are no concerns in institutional aspect.

As shown in Table 9, EWASCO had 77 employees at the time of the planning. It was pointed out that this number would need to be increased to around 100 because of the expansion of the water supply facilities as a result of the project. At the time of the ex-post evaluation, there were 110 employees. EWASCO hired a management consultant to create a more efficient organizational structure. In addition, operational reforms such as reducing non-revenue water and improving water charge collection system are taking place in order to improve their business structure.

As seen above, there are no issues in the institutional aspects of operations and maintenance.

Table 9 Staff Number of EWASCO

Unit: Person

Assignment	2009 Actual	2015 Proposal	2015 Actual
Manager	14	15	8
General Affairs and Financial Division	19	23	39
Water Treatment Division	7	18	14
Distribution Division	30	35	40
Sewerage Division	6	8	8
Planning Division	1	3	1
Total	77	102	110

Sources : Data provided by EWASCO

Note: 'Proposed number in 2015' was estimated by Japanese Consultants at the time of planning.

#### 3.5.2 Technical Aspects of Operation and Maintenance

At the time of the ex-post evaluation, EWASCO was supplying water 24 hours a day and there were no major technical issues relating to the operation or maintenance of the water

distribution facilities. Sixteen staff are still working at EWASCO out of the 17 staff who received technical training as part of the soft components of the project and this technical knowledge are shared within the organization by training new staff. Operational management record files were also introduced during the soft components. Information such as the volume of distributed water, water distribution hours, amount of power generated, and the results of water quality examinations are recorded every day. Quarterly reports are also produced. In the event of an issue in the facilities or equipment, employees refer to the manual to handle the situation and can contact the Kenyan manufacturer if necessary. No serious problems have occurred thus far.

EWASCO carries out the following training once a year:

- 1) In-house training carried out by an external instructor, mainly for water treatment plant staff
- 2) Short training in which EWASCO staff is sent to the water laboratory in Nairobi

In addition, Senior Volunteer who was experienced in water treatment plant maintenance has been sent by JICA to EWASCO since 2014.

Regarding to the water quality management, in addition to the soft components of the project, Japan Overseas Cooperation Volunteer has been sent to give technical trainings to EWASCO staff on how to use the examination equipment provided by the project. At the time of the ex-post evaluation, safe water that met national water quality standards was being supplied 24 hours a day, indicating that the necessary operational management knowledge is in place throughout the organization.

EWASCO recognizes the reduction of non-revenue water as a serious organizational challenge, and a non-revenue water unit was established in 2011. A pilot project for JICA's 'Project for Management of Non-Revenue Water' in Kenya (2010-2014) was carried out in EWASCO's water supply area, and the non-revenue water rate was reduced to 25% through various activities such as preparing the data necessary for carrying out measures against non-revenue water, building a framework, detection of leaks and prevention of water theft. At the time of the ex-post evaluation, the staff who were involved in the above non-revenue project were still working in the units, and the effects of the pilot project had been expanded to another two districts<sup>34</sup>.

As above, there are no technical issues in operation and maintenance.

### 3.5.3 Financial Aspects of Operation and Maintenance

Table 10 shows EWASCO's annual income for the last five years (2011-2015). Since the completion of the project in 2013, EWASCO's 'Water Supply and Sewage Revenue' and

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<sup>34</sup> Two of EWASCO's 75 water meter districts.

‘Water and Sewage Related Income<sup>35</sup>’ have increased, and there has been a major improvement in total revenue as a whole. However, various costs have also increased, including ‘labor costs’ resulting from the hiring of new employees to accommodate the expansion of the water supply area, ‘operation and production costs for the maintenance’ of the expanded water supply facilities and fundraising costs for recent activities such as the development of the sewage system, and extension of distribution pipes and repayment of loans from institutions such as banks for the replacement of aging pipes. EWASCO was in deficit in 2013 and 2014 but turned a profit in 2015. The main reason for EWASCO’s return to a positive figure was an increase in water charges, but ‘other income’ also increased through new customers requesting to be connected to the services and sales of pipes to communities.

According to an accounting auditor from EWASCO, the project not only increased the volume of water but also brought in additional revenue through water charges, helping to stabilize EWASCO’s finances. To supply the greater volume of water produced as a result of this project to more residents, EWASCO has been extending distribution pipes and renovating aging facilities with funds procured from banks and overseas aid agencies. Higher ‘fundraising cost’ was recorded for 2015 as EWASCO paid back all of its bank loans. This EWASCO’s investment in facilities has brought more customers, and even more revenue is expected in future. Therefore, EWASCO’s financial situation can be considered stable.

Table 10 Balance of Payment of EWASCO

Unit: Kenyan Shillings

Items	2011	2012	2013	2014	2015
Water Supply and Sewage Revenue	136,303,891	138,349,551	158,685,485	208,230,398	235,274,938
Water and Sewage Related Income	2,826,021	3,021,965	2,643,733	6,623,116	8,220,171
Other Income	7,556,552	13,284,055	6,406,765	2,233,614	11,134,815
<b>Total Revenues</b>	<b>146,686,464</b>	<b>154,655,571</b>	<b>167,735,983</b>	<b>217,087,128</b>	<b>254,629,924</b>
Administration Costs	12,234,484	15,583,309	16,005,775	21,004,717	22,397,893
Staff and Board Costs	56,832,884	67,332,616	75,499,926	85,075,188	101,076,506
Operation and Maintenance Cost (O&M)	78,092,726	56,380,060	81,048,447	124,819,958	117,392,329
Fundraising Cost	390,301	463,996	1,843,436	2,410,860	8,195,980
<b>Total Expenses</b>	<b>147,550,395</b>	<b>139,759,981</b>	<b>174,397,584</b>	<b>233,310,723</b>	<b>249,062,708</b>
<b>Balance</b>	<b>-863,931</b>	<b>14,895,590</b>	<b>-6,661,601</b>	<b>-16,223,595</b>	<b>5,567,216</b>

Sources: Data provided by EWASCO

EWASCO’s non-revenue water rate for 2015 was 40% - slightly below the national average of 42% but higher than the non-revenue rate that was anticipated at the time of the planning, indicating that more efforts were needed to secure revenue water that would be charged. In

<sup>35</sup> including service charge from new connection of water supply and sewage

EWASCO's water supply area, there is a high demand for more water, and it is expected that EWASCO's water supply facilities will need to be further expanded in future. However, there are no clear prospects about how to secure funds for this work. Therefore, it is important to tackle with reducing non-revenue water to stabilize EWASCO's finances.

In sum, while EWASCO's overall financial situation is stable, further improvement of its finances is needed.

#### 3.5.4 Current Status of Operation and Maintenance

At the time of the ex-post evaluation, the water intake facilities, water treatment plants and water distribution facilities were observed. All of the facilities built by the project were operating appropriately; water was being supplied continuously 24 hours a day, water meeting water quality standards was being produced, and no issues were observed. No serious problems such as a long period of the water supply disruption have occurred so far, and issues in the facilities and equipment are handled by referring to the manual. Thus, overall situation for operation and maintenance is appropriate.

In light of the above, no major problems have been observed in the institutional and technical aspects of the operation and maintenance system, but there is room for improvement in the financial aspect. Therefore, the sustainability of the project effects is fair.

## **4. Conclusion, Lessons Learned and Recommendations**

### 4.1 Conclusion

This project was conducted in Embu city and the surrounding areas of Kenya to supply safe water stably to the residents by expanding a water treatment plant and by constructing water distribution pipes. The relevance of the project is high, because the project was consistent with the development policy of Kenya and needs of the target area both at times of the project planning and the ex-post evaluation and with Japan's assistance policy at the time of planning. The efficiency is fair as the project outputs were completed almost as planned and the project cost was within the plan, although the project period was far longer than the plan because construction of distribution pipes by the Kenyan side was delayed. Implementation of the project brought positive effects including increase of water service connections, water revenue, and water supply amount as well as improvement of water supply hours. In addition, some positive impacts such as reduction of water borne diseases and water fetching labor were observed. Therefore, effectiveness and impact of the project are high. The facilities and the equipment were maintained as appropriate and no major issues were observed in the institutional and technical aspects of Embu Water and Sanitation Company (EWASCO). On the other hand, some issues remain to be improved in the financial aspect, thus the sustainability is deemed fair.

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

## 4.2 Recommendations

### 4.2.1 Recommendations to the Implementing Agency

#### Recommendations for EWASCO

Strengthening of countermeasures for non-revenue water: EWASCO's water supply area (especially outside of Embu City) has large differences in elevations, and therefore water pipe bursts due to high water pressure is an issue. Additionally, night time water theft from irrigation areas, water leaks from supply pipes and increasing measurement errors from aging water meters are all causes of non-revenue water. There is a need for a comprehensive investment, such as increasing manpower for non-revenue water units and replacing equipment (water pressure adjustment: installation of reduction valves and renewal of aging water supply pipes and faulty meters) in order to deal with these issues. In addition, it is also important for crackdowns on water theft during the dry season to be strengthened, and enlightenment activities should be implemented for the residents in areas where water theft is commonplace.

#### Recommendations to the County

Creation of a county-level master plan for water supply sectors concerning the new construction and extension of water supply facilities: It is important to continue implementing new construction and extension of all water supply facilities to deal with the increasing population that requires a water supply. For this reason, it is essential to accurately understand the current situation and issues of water supply sectors (calculation of the water distribution demand from the population of the water supply area and calculation of the amount of water shortage based on this figure). Then, efforts should be made towards drafting of a master plan to ensure stable water supplies in the future by appointing external staff, and seeking assistance from foreign donors.

### 4.2.2 Recommendations to JICA

None.

## 4.3 Lessons Learned

In projects where there is a large component on the recipient side, it is essential to examine funding sources other than government budgets at the project planning.

In this project, the Kenyan side agreed to the equivalent of approximately 360 million yen of the financial burden, and to complete distribution pipe extension work which was important part of the project effects. After the project started, changes to the administrative system due to



decentralization occurred resulting in delays to the budget allocation, which caused delays in particular to the distribution pipe extension work which was part of the Kenyan outputs. However, EWASCO did not simply wait for approval of the budget that was promised by the government at the time of the planning. Instead, they searched for additional funding sources from Kenyan banks or loan schemes operated by international aid agencies, and requested budgets within the county in order to secure funds to complete the project successfully.

From this, for the grant aid project, in cases where there is a large component on the recipient side, and the component was important part of the project effect, it is necessary to examine the recipient's ability carefully at the project planning. Also, alternative financing schemes such as from international aid agencies or domestic banks should be considered to prepare for the delayed disbursement of the government budget. It is also effective to search local government agencies that may be the funding sources and to share details of the project with them.

For projects in countries undergoing decentralization, create a monitoring plan during the planning stage and strengthen monitoring during project implementation

After the project started, constitutional reforms promoting decentralization were implemented, and government agencies were reorganized after the project was completed. In addition, the implementation system for the water sector was also restructured. As a result of these changes, the government's budget allocation was delayed and the project period largely exceeded the planned period.

For projects implemented in countries where decentralization is progressing, it is essential to fully research the risks that may be caused by decentralization, such as restructuring of administrative systems or jurisdictions, changes to budgetary lines, and the personnel transfer at the time of project planning. It is also preferable to prepare and agree a monitoring plan that defines the responsible implementation agency and frequency of monitoring with the recipient government. Furthermore, if there are changes to the administration system due to decentralization during the project implementation, detailed monitoring will become particularly important. Especially when the implementing agency or schedule for the component on the recipient side would be changed, it is important to strengthen monitoring activities and obtain agreement documents to ensure the project completion according to the plan. If the project implementation by the recipient side which was important part of the project effects is expected to be delayed, it will also be important to revise the target year of project effect indicators.