

Republic of Kenya

FY2018 Ex-Post Evaluation of Japanese Grant Aid Project

“The Project for Rural Water Supply in Baringo County”

External Evaluator: Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

## **0. Summary**

This project constructed deep well water supply facilities in Baringo County with the aim of improving local residents' access to safe drinking water. Realization of sustainable access to safe and stable supply of water is well consistent with the development policy and development needs of Kenya, as well as with Japan's ODA policy. Therefore, the relevance of the projects is high. With regards to project implementation, although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair. Regarding project effectiveness, the quantitative effects have achieved the targets for both water supply rate and water supply population. For qualitative effects, the interviews with the local residents confirmed that the project improved their access to water supply facilities, which contributed to the improvement of their labor burden (especially for women and children) to fetch water. Regarding impacts, the availability of sanitary water from the water supply facilities developed by this project has led to the improvement of hygiene conditions of the local residents. In addition, the implementation of the soft component (capacity building program) in this project has largely raised the hygiene awareness of local residents. Furthermore, the project has contributed to the improvement of school attendance and employment rate. Therefore, the project has largely achieved its objectives, and thus effectiveness and impacts are high. No negative impacts on natural environment nor land acquisition have been reported. With regards to operation and maintenance, although no particular problem has been identified regarding the technical and financial aspects, some minor problems have been observed in terms of the institutional/organizational aspect and current status. Therefore, sustainability of the project effects is fair.

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

## 1. Project Description



Project Location



Communal faucets and residents who came to buy water

### 1.1. Background

Kenya has put up water and sanitation as one of the development issues in the national development plan, *the Vision 2030*, with the goal of achieving safe water access for all nationals. To this end, the government has been promoting water sector reform, improvement of management of water supply entities, repair of existing water supply facilities and construction of new water supply facilities. However, water supply rate in rural areas remained low at about 40% (as of 2011), which was also pointed out as a cause of waterborne diseases.<sup>1</sup> Thus, securing safe water supply was an urgent issue.<sup>2</sup> This project constructed deep well water supply facilities (borehole drilling, pumping facilities, water storage tank, communal faucets, transmission pipes to faucets and water trough for livestock) in Baringo County.

### 1.2 Project Outline

The objective of this project is to improve local residents' access to safe drinking water by constructing deep well water supply facilities in Baringo County, thereby contributing to the improvement of hygiene condition of the local residents.

Grant Limit / Actual Grant Amount (Detail Design)	131 million yen / 130 million yen
Grant Limit / Actual Grant Amount (Main Work)	1,042 million yen / 1,025 million yen

<sup>1</sup> The number of cases of waterborne diseases (diarrhea, typhoid, dysentery) in Central Baringo Hospital in 2009 was approximately 13,500 out of the 162,000 population.

<sup>2</sup> Information from the materials provided by JICA.

Exchange of Notes Date / Grant Agreement Date (Detail Design)	January 2013 / January 2013
Exchange of Notes Date / Grant Agreement Date (Main Work)	July 2013 / July 2013
Executing Agency	Rift Valley Water Services Board
Project Completion	March 2016
Target Area	Baringo County
Main Contractor	Tone Engineering Corporation
Main Consultants	CTI Engineering International Co., Ltd. / OYO International Corporation Co., Ltd. (JV)
Procurement Agency	—
Preparatory Survey	December 2010 – December 2011
Related Projects	[Technical Cooperation] The Project on the Development of the National Water Master Plan 2030 (October 2010 – June 2013)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Masumi Shimamura, Mitsubishi UFJ Research and Consulting Co., Ltd.

### 2.2 Duration of Evaluation Study

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

Duration of the Study: October 2018 – February 2020

Duration of the Field Study: January 18 – February 6, 2019

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

### 3.1 Relevance (Rating: ③<sup>4</sup>)

#### 3.1.1 Consistency with the Development Plan of Kenya

At the time of planning, the Government of Kenya has put up water and sanitation as one of the development issues in the national development plan, *the Vision 2030* (June 2008), with the goal of achieving safe water access for all nationals. To this end, the government has been promoting water sector reform, improvement of management of water supply entities, repair of existing water supply facilities and construction of new water supply facilities. In

<sup>3</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>4</sup> ③: High, ②: Fair, ①: Low

addition, *the National Water Services Strategy* (2007-2015) stated that rural areas shall increase sustainable access to safe water that meets the Kenyan national standards. This project aims to improve access of local residents to safe drinking water in rural villages (Baringo County), and it can be said that the project was consistent with the development policy at the time of planning.

At the time of ex-post evaluation, the Government of Kenya puts up water and sanitation as one of the development issues in *the Third Medium Term Plan* (2018-2022), which embodies *the Vision 2030*, and emphasizes improving access to safe water as a priority issue. The Government of Kenya has been drafting *the National Water and Sanitation Services Strategy* (2019-2030), since the enactment of *the Water Act 2016*, and will continue to improve access to safe water. Furthermore, *the National Water Master Plan 2030* also aims to realize sustainable access to safe and stable supply of water. The implementation of the project is also consistent with Kenya's development policy at the time of ex-post evaluation.

### 3.1.2 Consistency with the Development Needs of Kenya

At the time of planning, water supply rate in rural areas in Kenya remained low at about 40% (as of 2011) and securing safe water supply was an urgent issue. Of these, the water supply rate of safe water in Baringo County, which is the target area of the project, was particularly low at about 24%, and it was urgently necessary to secure safe and stable water sources.

At the time of ex-post evaluation, improvement of access to safe and sanitary drinking water for local residents in rural areas including Baringo County is still an issue. In addition, in Baringo County, the water supply rate in 2018 remained low at 37% and the ratio of population with access to safe water was 25.9%. The following problems have also been pointed out, and further development and repair of water supply facilities is necessary.

- Many local residents need long distance walk to access the water sources.
- Water quality is poor. (Not hygienic nor safe.)
- Existing water supply facilities are aging.
- Water management system of distribution network is inefficient etc.

Therefore, the project is consistent with the development needs of Kenya and Baringo County both at the time of planning and ex-post evaluation.

### 3.1.3 Consistency with Japan's ODA Policy

At the time of planning, the Government of Japan's *Country Assistance Policy for the Republic of Kenya* stated that "water resource conservation" should be addressed as a development issue, and that support for the improvement of water supply rate and water

supply volume should be provided through the “Water Supply and Water Resource Management Program”. In addition, the project was considered to contribute to the “Effective Water Resource Management and Improvement of Supply of, and Access to Safe Water” announced in the Yokohama Action Plan 2013 in the Fifth Tokyo International Conference on African Development (TICAD V). In light of the above, the project was consistent with Japan’s ODA policy at the time of planning.

This project has been highly relevant to the country’s development plan and development needs, as well as Japan’s ODA policy. Therefore, its relevance is high.

### 3.2 Efficiency (Rating: ②)

#### 3.2.1 Project Outputs

This project constructed deep well water supply facilities (borehole drilling, pumping facilities, water storage tank, communal faucets, transmission pipes to faucets and water trough for livestock) with the aim of improving local residents’ access to safe drinking water in Baringo County. Table 1 shows the comparison of planned and actual outputs of this project.

Table 1: Comparison of Planned and Actual Outputs

Plan	Actual	Comparison
Detailed Design		
Implementation of detailed design of the project	Implementation of detailed design of the project	As planned.
Construction of Facilities		
Construction of independent deep well water supply facilities at 90 sites (power system: solar power in 43 sites, commercial electricity in 37 sites, generator in 10 sites)	Construction of independent deep well water supply facilities at 70 sites (power system: solar power in 24 sites, commercial electricity in 37 sites, generator in 9 sites)	The number of project sites was changed from 90 to 70.
Procurement of Equipment		
<ul style="list-style-type: none"> <li>• 1 double cabin pick-up (4WD)</li> <li>• 2 motor bikes (175cc)</li> <li>• 1 desktop computer</li> <li>• 1 printer</li> </ul>	<ul style="list-style-type: none"> <li>• 1 double cabin pick-up (4WD)</li> <li>• 2 motor bikes (175cc)</li> <li>• 1 desktop computer</li> <li>• 1 printer</li> </ul>	<ul style="list-style-type: none"> <li>• As planned.</li> <li>• As planned.</li> <li>• As planned.</li> <li>• As planned.</li> </ul>

Soft Component (Capacity Building)		
<ul style="list-style-type: none"> <li>• Improvement of operation and maintenance capacity of water user association</li> <li>• Improvement of capacity of the District Water Office workers to support residents</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of operation and maintenance capacity of water user association</li> <li>• Improvement of capacity of the District Water Office workers to support residents</li> </ul>	For some activities (monitoring of operation and maintenance status), the number of target sites was changed from 90 to 70. No other changes took place and soft component was implemented at 90 sites.

Source: Results from questionnaire survey of executing agency and project consultant

This project has had significant changes from the original plan. Specifically, the number of construction sites for water supply facilities was changed from 90 to 70. As a result, the number of target sites for some of the activities of the soft component (monitoring of operation and maintenance status) was changed from 90 to 70.

The background of the changes in project scope was the two-year gap between the preparatory survey (implemented in 2011) and the detailed design (implemented in 2013) due to the effects of the Great East Japan Earthquake in 2011. During that period, the local conditions on the Kenyan side have changed. Specifically, (1) deterioration of security situation in East Pokot (currently Tiaty<sup>5</sup>), (2) migration of villagers, (3) development by other donors and (4) development status of the power etc. were taken into consideration. For this reason, re-evaluation of construction sites and review of the plan of the entire target areas were carried out during the detailed design, and some construction sites were excluded<sup>6</sup> and added.<sup>7</sup> In addition, (5) failure wells were removed from the target sites as a result of actual drilling by the contractor. As a result, the number of construction sites was reduced by 20 in the end. These changes in the project scope were difficult to foresee at the project planning stage and are considered appropriate.

The reason that the target sites of some activities for the soft component were changed from 90 to 70 was that the construction of water supply facilities by the counterpart fund project,<sup>8</sup> which was implemented in East Pokot (currently Tiaty), was delayed. Thus, the activities could no longer take place. The supervision of the construction of the counterpart

<sup>5</sup> At the time of ex-post evaluation, East Pokot was renamed to "Tiaty".

<sup>6</sup> Out of total of 118 sites – the initially planned 90 sites and the reserved 28 sites – 57 sites were excluded.

<sup>7</sup> Nine sites were added during the detailed design.

<sup>8</sup> The Government of Kenya constructed the water supply facilities utilizing the counterpart fund, for which the executing agency of the construction is the Kenyan Government. When the number of construction sites for this project was reduced, the reduced scope was included in the counterpart fund project as the project of Kenyan side due to a strong request from the Government of Kenya. Whereas the soft component was included in this project.

fund project is under the jurisdiction of Kenyan side and the construction could not be completed within the period of this project. Thus, “monitoring of operation and maintenance status” in East Pokot (currently Tiaty) was excluded. It is not realistic to wait for the completion of the counterpart fund project in order to carry out the activities, and it can be considered that reducing the scope was an appropriate decision. Other soft component activities were implemented as planned, including in East Pokot (currently Tiaty). Regarding the activities in East Pokot (currently Tiaty), since the Japanese could not enter the site due to the deteriorating security situation, the trainees at the site were invited to Marigat (currently South Baringo<sup>9</sup>) to receive the training.

Regarding the tasks to be undertaken by the Kenyan side necessary for the project implementation, there were three sites where the tasks regarding the introduction of commercial power lines<sup>10</sup> for operating water supply facilities had not been completed at the time of ex-post evaluation. In all three cases, the water supply facilities themselves are completed but cannot be operated due to insufficient power voltage. At the time of the defect inspection, the same problem was pointed out for the same sites, and JICA requested the executing agency to make improvements as soon as possible, however, at the time of ex-post evaluation, no improvement was seen and there was no future outlook. (Refer to “3.4.4 Status of Operation and Maintenance” as described later.) As a result of interviews with the executing agency and the project consultant, it was confirmed that other tasks were implemented without any problems.



Solar panel, water storage tank and communal faucets



Generator

<sup>9</sup> At the time of ex-post evaluation, Marigat was renamed to “South Baringo”.

<sup>10</sup> There are three types of power system for the water supply facilities developed by this project: solar power, generator, and commercial electricity. As shown in Table 1, the breakdown of 70 water supply facilities by power system is; solar power in 24 sites, commercial electricity in 37 sites and generator in 9 sites.



Pumping facilities



Water trough for livestock

### 3.2.2 Project Inputs

In this project, it is not possible to objectively grasp to what extent the reduction of outputs has led to the changes in outcomes (project effects). Therefore, the inputs (project cost and project period) were analyzed by simply comparing the planned and actual. Specifically, as described later in “3.3.1.1 Quantitative Effects” of “Effectiveness”, the target figures for the 90 sites that had been originally planned were adopted, and a simple comparison was made with the actual figures after output reduction (the 70 sites) (see below for the reasons). Despite decrease in outputs, each indicator exceeded the target in the original plan, and outcomes were observed as planned. Therefore, it is not possible to grasp to what extent the reduced outputs has led to reduced outcomes. See also “Lessons Learned” as described below.

#### 3.2.2.1 Project Cost<sup>11</sup>

The project cost was initially planned to be 131 million yen for the detailed design. In fact, it was 130 million yen, which was within the plan. (99% of the plan.) For the main work (construction of facilities, procurement of equipment and the soft component), the project cost was initially planned to be 1,203 million yen, whereas in actuality, it was 1,055 million yen, which was within the plan (88% of the plan). Of this amount, the Government of Kenya disbursed 30 million yen as planned.

#### 3.2.2.2 Project Period

The project period (detailed design and main work) was initially planned to be 36 months, but it was 39 months actually, exceeding the plan (106% of the plan). The project

<sup>11</sup> Since separate Exchange of Notes were concluded for the detailed design and the main work, comparison between the planned and the actual was made for each.



period exceeded the plan because the detailed design was extended from the original plan. This was because issues to be adjusted has increased due to the deterioration of security situation in East Pokot (currently Tiaty). There were no delays in the main work, and it was implemented as planned.

Table 2 summarizes the comparison between planned and actual project period.

Table 2: Comparison of Planned and Actual of Project Period

Plan	Actual
Feb. 2013–Jan. 2016 (36 months)	Feb. 2013–Mar. 2016 (38 months)
Breakdown: Detail Design	
Feb. 2013–Sept. 2013 (8 months)	Feb. 2013–Nov. 2013 (10 months)
Breakdown: Prequalification and Tendering:	
Oct. 2013–Dec. 2013 (3 months)	Dec. 2013–Feb. 2014 (3 months)
Breakdown: Construction Work	
Feb. 2014–Jan. 2016 (24 months)	Apr. 2014–Mar. 2016 (24 months)
Soft Component	
May 2014–Apr. 2016 (24 months)	Jul. 2014–Jun. 2016 (24 months)

Source: Information provided by JICA and results from questionnaire survey of executing agency

Note) Definition of project completion is completion of construction work. Project period does not include defect liability period and soft component period in both the plan and the actual.

Although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair.

### 3.3 Effectiveness and Impacts<sup>12</sup> (Rating: ③)

#### 3.3.1 Effectiveness

##### 3.3.1.1 Quantitative Effects

At the time of planning, water supply rate and water supply population in four Districts of Baringo (the name has been changed to “Sub-county” at the time of ex-post evaluation) were set as quantitative effects of the project. As described in “Efficiency” above, the number of construction sites for water supply facilities by this project was reduced from 90 to 70, however, the target figures for the 90 sites that had been originally planned were adopted, and a simple comparison was made with the actual figures after output reduction (the 70 sites) for the following reasons.

<sup>12</sup> Sub-rating for Effectiveness is to be put with consideration of Impacts.

- Reason 1: In addition to East Pokot (currently Tiaty), which was excluded due to the security problems, some sites in three Sub-counties (North Baringo, Marigat (currently South Baringo) and Central Baringo) were excluded for the reasons other than security problems. Thus, strictly speaking, the target areas as regards to the target and the actual figures are not consistent just by excluding East Pokot (currently Tiaty).
- Reason 2: Some water supply facilities in East Pokot (currently Tiaty) which were not constructed by the project were also included in the soft component of this project.

Table 3 summarizes baseline, target and actual figures in 2019 for each indicator. As the project completion is March 2016, the target year to be compared is 2019, three years after completion. As an additional indicator, the number of active wells (the actual figures) out of 70 sites developed by the project is shown in the table.

Table 3: Quantitative Effects of the Project

Indicators	Baseline	Target	Actual
	2011	2017 (3 years after project completion)	2019 (3 years after project completion)
[Effect Indicator] Water Supply Rate (%) (Four Sub-counties of Baringo)	24.4	35.7	37 (104% of target)
[Operation Indicator] Water Supply Population (person) (Four Sub-counties of Baringo)	98,000	157,580	159,180 (101% of target)
<Additional Indicator> [Operation Indicator] Number of Active Wells out of 70 sites developed by the project	—	—	63 (Operating rate 90%)

Source: Information provided by JICA and results from questionnaire survey of the Baringo County Government

Note 1) The definition of each indicator is as follows.

- Water supply rate (%) = Water supply population / population within the area x 100
- Water supply population = Population receiving water supply by the water supply facilities

Note 2) The baseline and target for water supply rate and water supply population are the figures in four Sub-counties of Baringo County (North Baringo, Marigat (currently South Baringo), Central Baringo and East Pokot (currently Tiaty)).

Since the “difference” between baseline and target figures for each indicator in Table 3

above is the target figures for the original 90 sites, comparison of planned and actual figures was made in Table 4 for the difference in the water supply rate and water supply population.

Table 4: Comparison of Planned and Actual *Difference* in Water Supply Rate and Water Supply Population

Targets for 90 sites assumed at the time of planning		Actual figures for 70 sites developed by this project		Difference
Difference of Water Supply Rate (%) (Four Sub-counties of Baringo)	11.3%	Increase in Water Supply Rate (%) (Four Sub-counties of Baringo)	12.6%	+1.3%
Difference of Water Supply Population (person) (Four Sub-counties of Baringo)	59,580	Increase in Water Supply Population (person) (Four Sub-counties of Baringo)	61,180	+1,600

Source: Calculated based on results from questionnaire survey of the Baringo County Government and JICA

Despite the decrease in outputs (the number of project sites was reduced from 90 to 70), the actual figure of water supply rate increased by 1.3% from the target, and the actual figure of water supply population increased by 1,600 from the target, both exceeding the original targets. In addition, as shown in Table 3, the achievement rate of each indicator is 104% for water supply rate and 101% for water supply population. As an additional indicator, 63 out of 70 water supply facilities developed by the project were operating at the time of ex-post evaluation. (Operating rate is 90%.) Although seven water supply facilities have suspended their operation, water supply rate and water supply population have reached the targets for 90 sites.

Based on the most recent development plan of the Baringo County Government, as regards water supply population, its growth rate (2009-2017: about 3.4% per annum) is considered to exceed the population growth rate at the time of planning (about 1.6%). It is presumed that such increase in population was a factor that boosted the actual figure. However, considering that the water supply rate is higher than the target as if 90 sites were constructed despite the population increase, it is relevant to consider that the planned quantitative effects have achieved. In addition, water supply population includes people who come to Baringo County to purchase water from other areas, but such people are very limited. Thus, the water supply rate shows the rate of four Sub-counties of Baringo County.

As regards the setting of quantitative effects of the project, the executing agency did

not have a common understanding with JICA about how to derive baseline and target figures. Specifically, they did not recognize that the “difference” between the baseline and the target in Table 3 would be the target figures for the originally planned 90 sites. In addition, JICA and the executing agency did not review or agree on the baseline and the target for the quantitative effects in light of the significant reduction of outputs. Refer to “Lessons Learned” below for this issue.

### 3.3.1.2 Qualitative Effects (Other Effects)

As qualitative effects of the project, it was anticipated that improvement of fetching water labor would be realized. As a result of interview survey with local residents<sup>13</sup> conducted during the project site survey, all the local residents living near the operating water supply facilities (11 out of 13 surveyed sites were in operation) pointed out that labor of fetching water was improved as a result of improvement of water supply facilities by the project. As a summary, local residents pointed out that “Before the project, local residents fetched water from water sources (streams and springs) 1 to 5 km away, and they had been working hard for more than 1 hour to 5 or 6 hours every day, including waiting time at the water sources. However, after the project, it became possible for them to fetch water within about 30 minutes for a round trip.” All respondents were satisfied that their burden has greatly reduced. They mentioned that fetching water for living was mainly a job for women and children, and the use of their time and lifestyle have changed as a result of reduced burden and working hours after the project. (Refer to “Impacts” for details.)



Local residents who came to buy water



Children queueing in front of communal faucet

<sup>13</sup> Total of 78 people living near 13 sites out of the 70 sites developed by the project were the target for interview survey. (49 men and 29 women.) The breakdown of interviewees is shown in the table in the Attachment at the end.

### 3.3.2 Impacts

#### 3.3.2.1 Intended Impacts

In this project, (1) improvement of hygiene condition, (2) improvement of hygiene awareness and (3) improvement of school attendance and employment rate were expected as impacts. The appearance of these impacts is described below in the results of interviews<sup>14</sup> with local residents carried out during project site survey.

#### (1) Improvement of Hygiene Condition

All the local residents living around 11 operating water supply facilities responded that hygiene condition improved after the project. Residents pointed out that sanitary water became available from the water supply facilities developed by the project and that water consumption increased, resulting in the following changes.

- They started to drink water from water facilities frequently.
- The frequency of their washing hands, cleaning, doing laundry and bathing has increased.
- They can now milk cows and goats with clean hands.
- They can now wash vegetables during cooking.
- Incidence of diseases such as skin diseases, colds, diarrhea, typhoid and amoebic dysentery has decreased after using water from water supply facilities.

A principal of an elementary school adjacent to the water supply facility pointed out that after the project, students were able to use water to clean the school, and that the incidence of diseases such as diarrhea and typhoid was reduced. In addition, a principal of an elementary school adjacent to the project site where the water supply facility was under suspension pointed out that after water supply has stopped, the number of students who do not wash their hands after toilet increased and that they could not clean the school.

A nurse at a hospital where water supply facility has been constructed on the property responded that after the project, she has been fully utilizing the sanitary water from the water supply facility. She also pointed out that burden on pregnant women during childbirth has been reduced in particular.<sup>15</sup> In addition, number of diarrhea, typhoid and amoebic dysentery patients was sorted based on patient records (registration book) who visited hospitals and health centers. As a result, number of patients of both institutions has decreased after the water supply facilities started operation. Nurses also stated that they

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<sup>14</sup> The interviewees are the same 78 people mentioned in footnote 13. The breakdown of interviewees is shown in the table in the Attachment at the end.

<sup>15</sup> According to the nurses, before the project, pregnant women had to bring 20 liters of water to the hospital for their own birth. She mentioned that sanitary water from the water supply facility is useful since a lot of water is used during childbirth.

felt the reduction in the number of such patients.

Table 5: Number of Diarrhea, Typhoid and Amoebic Dysentery Patients among Kimalel Hospital Patients

Period	Number of Patients
January–March 2014	308
January–March 2015	318
January–March 2016	272
January–March 2017	47
January–March 2018	149

Source: Kimalel Hospital

Note 1) The water supply facility built in the premises of the hospital started its operation in March 2016.

Note 2) During the dry season (January to March), the utilization rate of water supply facilities is higher than during the other period.

Table 6: Number of Diarrhea, Typhoid and Amoebic Dysentery Patients among Kiboino Location Health Center Patients

Period	Number of Patients
January–March 2014	65
January–March 2015	31
January–March 2016	12
January–March 2017	23
January–March 2018	17

Source: Health Center in Kiboino Location

Note 1) The water supply facility near the health center started its operation in February 2016.

Note 2) During the dry season (January to March), the utilization rate of water supply facilities is higher than during the other period.

As seen from the above, availability of sanitary water from the water supply facilities developed under the project has led to improvements in hygiene conditions. Although correlation between the project and the reduction of number of water-related diseases such as diarrhea, typhoid, and amoebic dysentery cannot be verified, it can be inferred that the project has contributed to a certain extent to the reduction of the number of patients with waterborne diseases in light of the interviews with residents, hospital/ health

center patient record data, and responses from nurses.

## (2) Improvement of Hygiene Awareness

Under the capacity building program (soft component) of the project, hygiene training was conducted for local residents (committee members of the water user association). All the local residents who received the training at the 11 operating water supply facilities responded that after the training, their awareness of hygiene improved, and that their behavior also changed as follows. They also pointed out that knowledge acquired in the training was shared with other local residents.

- They are mindful about washing buckets and other water containers to keep them clean.
- They are careful to keep the water hygienical in the water supply facilities.
- They have come to wash their hands after toilet, before cooking, before milking livestock, and after taking care for livestock.
- They try to keep their houses clean.
- Students can now clean the school with water.
- They have come to wash livestock.

On the other hand, residents responded that in most of the water supply facilities, the number of water users decreases during the rainy season<sup>16</sup> (October to December is a light rainy season and March to May is a heavy rainy season). They mentioned that some people still use rain water and water from streams and springs during rainy season in order to save water purchase cost. Since such water is not sanitary, it is necessary to conduct continuous awareness raising activities for local residents.

A good practice can be highlighted about the synergy between the project (specifically, Kibingor water supply facility in Marigat (currently South Baringo)) and the initiatives of a foreign NGO (Compassion in the Netherlands). Ten months after the construction of the water supply facility by the project (December 2016), the NGO began its activities in the areas surrounding the water supply facility and conducted sanitation education and community support. These activities have also been successful, and hygiene awareness has spread and has become established among the local residents. Unlike the trends in other project areas, water supply facilities have been used stably throughout the year in this project area (number of users during rainy season has not decreased). Activities of water user association are active, and activities to promote hygiene awareness are carried

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<sup>16</sup> As regards the local residents living near the 11 water supply facilities where interviews were conducted, on average, more than 90% of the residents use water from the water supply facilities during dry season, but their user rate reduces to about 40 to 60% during heavy rainy season.

out in a participatory approach.<sup>17</sup> In addition, after the project, a secondary school was opened in an adjacent area in January 2017, and the number of students are increasing. According to the principal, June 20 is designated as a “Hand Washing Day” every year, and hand washing is being enforced. The school has never had diarrhea, typhoid or amoebic dysentery since its opening.

Based on the above, although it is necessary to continue awareness raising activities for the local residents, a project site attracting attention as a good practice case exists. In addition, knowledge acquired by the participants of hygiene training has been shared with other local residents, and their behavior changes has observed as a whole. In light of the above, it can be said that the improvement of hygiene awareness has been largely achieved.

### (3) Improvement of School Attendance and Employment Rate

Regarding school attendance rate, some principals and teachers of the schools adjacent to the water supply facilities responded that after the project, there was no student who was late or absent from classes due to fetching water. They also pointed out that the inflow of residents has led to an increase in population and an increase in number of students as a result of development of water supply facilities. On the other hand, it was indicated that an elementary school adjacent to the facility where the water supply was suspended has reduced its class hours and educational opportunities. Furthermore, it was also mentioned that residents have relocated to other villages and the number of students has decreased.

With regard to employment rate, it was confirmed that as a result of reduced water-fetching labor, some residents are spending their spare time on caring for livestock, growing and selling vegetables, doing business at kiosks, and caring for children, and that some residents have increased their income due to economic activities. In addition, some said that there were cases where women started business utilizing microfinance.

From the above, it is considered that the project has contributed to the improvement of school attendance and employment rate.

#### 3.3.2.2 Other Positive and Negative Impacts

##### (1) Impacts on the Natural Environment

After submitting the project report (well drilling location information) to the National Environment Management Authority, it was determined that the environmental impact

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<sup>17</sup> Forum for residents through mutual participation are held in public meetings and meetings hosted by the Area Chief.



assessment (EIA) survey was not necessary for all project sites and the executing agency was granted an environmental permit.<sup>18</sup> According to the executing agency and the project consultant, environmental monitoring (water quality, noise, vibration, soil, waste) during the project implementation has been carried out by visual observation, etc. As a result, no negative impacts on natural environment have been reported, and at the time of ex-post evaluation, no land subsidence or depletion of water sources due to pumping was reported. When asked local residents during the site survey, no impacts on natural environment during or after construction have been pointed out and no complaints have been reported. Rather, local residents were watching the progress of construction, looking forward to the completion of the water supply facilities.

From the interviews with the executing agency, the project consultant and local residents, as well as from the results of site survey at the time of ex-post evaluation, no major problem with respect to natural environment has been identified.

## (2) Resettlement and Land Acquisition

Acquisition of private land took place in 12 sites of all project sites (70 locations). In the other 58 locations, the project was conducted in public lands or in public school premises.<sup>19</sup> For private land where deep wells have been drilled, agreements have been signed between the land owner, the area chief, and all parties concerned in the Water Services Board, and compensation etc. has been provided to the land owner based on the price of the land. In addition, it was pointed out that for some sites, agreements were made to provide landowners with free water for two years. When excavation was conducted in hospital or church premises, the land was donated from the hospital or church. According to the executing agency and the project consultant, in case the landowner did not agree with the drilling of wells in their land, the land was excluded from the project site, and therefore no complaints have been pointed out as regards land acquisition. No complaints have been pointed out from local residents during the site survey as well. In addition, resettlement did not take place.

From the above, it is considered that there was no particular problem with land acquisition.

## (3) Other Impacts

Other impacts include 1) participation of women in the water user associations, 2)

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<sup>18</sup> After the project report is submitted, the National Environment Management Authority reviews the report and in case it is judged that impacts on the environment are minimal or negligible, then an "environmental permit" is granted.

<sup>19</sup> According to the data provided by the executing agency, the average area for land acquisition was 254 m<sup>2</sup> per site.

community expansion and activation by inflow of residents, and 3) emergence of residents who resell water and do business.

1) Regarding women's participation in water user associations, water user associations have been established at all 13 sites (including water supply facilities that were not in operation) where interviews were conducted, and it was confirmed that women were appointed as committee members in all water user associations. There were three committees where the number of women was the same as or more than men. In some committees, women served as chair or vice chair. In addition, it was confirmed that women's voices were considerably reflected in discussions and decision-making of the committees, since securing water for daily use is mainly a job for women and children in the field.

2) Regarding community expansion and activation by inflow of residents, interview survey indicated that population has flowed in, community has expanded, and the area has been revitalized with the improvement of water supply facilities by the project. According to the Baringo County Government, water demand in these population inflow areas is increasing and a possibility of drawing water pipe (piped water supply) is considered in the future. On the other hand, it was pointed out that in villages where water supply was suspended due to pump failure, local residents was outflowing to other areas and that population was decreasing.

3) As unintended impact, emergence of residents who resell water and do business can be pointed out. Interview survey indicated that some people were earning income by buying large volume of water with trucks from the neighboring Elgeyo-Marakwet County and re-selling the water where they came from. The purpose of the water supply facilities developed by the project is to provide affordable and good-quality water to a wide range of local residents, and thus water is supplied to everyone with impartiality. However, some people are taking advantage of it for business purposes, and some of local residents expressed complicated feelings regarding the matter. However, such people are very limited and there is no negative impact to the initially assumed beneficiaries that they cannot get necessary amount of water.

This project has largely achieved its objectives. Therefore, effectiveness and impacts of the project are high.

### 3.4 Sustainability (Rating: ②)

#### 3.4.1 Institutional/Organizational Aspect of Operation and Maintenance

The operation and maintenance work of the water supply facilities after project completion

has been transferred from the Rift Valley Water Services Board to the Baringo County Government with the enactment of *the Water Act* in April 2017 (*Water Act 2016*). By this, the operation and maintenance of the water supply facilities developed by the project, personnel and budget have been transferred to the Baringo County Government. Table 7 shows the officers in charge of operation and maintenance of the project in the Baringo County Government. These personnel are responsible for the operation and maintenance of all the water supply facilities including this project under the jurisdiction. As for sub-county water offices in the field, the Central Baringo Water Office has substantial number of technical staff and technical assistants, however, the North Baringo Water Office and the South Baringo Water Office are encountering shortage of staff. In the future, with the development of new water supply facilities, operation and maintenance work will increase and it is necessary to increase the number of personnel accordingly. According to the Baringo County Government, it is still in the middle of organizational structure reform and personnel and organization may change in the future.

Each sub-county water office is in charge of operation and maintenance of all water supply facilities under its jurisdiction, including the project, and there is a system that each office is required to report to the Operation and Maintenance Division of Water Supply Department of the Baringo County Government Head Office. Each sub-county water office and the Operation and Maintenance Division of the Water Supply Department of the Baringo County Government Head Office are constantly in communication and close collaboration system is in place. In addition, technical staff of the Operation and Maintenance Division of the Head Office are dispatched to each sub-county water office as appropriate according to the situation, enabling a flexible support system.

Table 7: Officers in Charge of Operation and Maintenance in Baringo County Government

Administrative Supervisor of the Baringo County Government (Total of 5)	
County Executive Committee (CEC)	1
Chief Officer (CO)	1
Principal Superintendent of Water	1
Chief Superintendent	2
Operation and Maintenance Division of Water Supply Department of the Baringo County Government Head Office (Total of 11)	
Principal Superintendent	1
Senior Superintendent	1
Technical Staff (including Electronic Technician)	8
Driver	1

Sub-County Water Office	Central Baringo Water Office (Total of 21)	North Baringo Water Office (Total of 12)	South Baringo Water Office (Total of 8)
Chief	1	1	1
Sub-Chief	1	1	1
Technical Staff	6	4	4
Technical Assistant	11	5	1
Volunteer	1	-	-
Office Worker	1	1	1

Source: Results from questionnaire survey of Baringo County Government

Note) There is a system in place that technical staff of the Water Supply Department in the Baringo County Government Head Office to flexibly support each sub-county water office as needed.

According to the Baringo County Government, water user associations are established at all sites including water supply facilities that are not in operation. (Even for the suspended water supply facilities, the committee members hold meetings as needed to engage and follow up with the Baringo County Government.) According to interviews with local residents (committee members), committee members are selected by the local residents and the term varies by association but between 3 and 5 years. Within the committee, there are roles such as chair, vice chair, accountant, secretary, operator, etc., and regular (Once a month to once a quarter. Frequency varies by committee.) and ad-hoc meetings are held. The contents of their meetings cover a wide range of issues, including the state of use of water supply facilities, water sales and financial situation, confirmation of power supply status, future issues, communication with the Baringo County Government, and awareness raising activities of local residents etc. All committee members interviewed at the project sites were in their first term, and it was confirmed that women are also participating and actively engaged in the committee activities.

If there are problems with the water supply facilities that cannot be dealt with by each committee or if there are issues for consultation with the Baringo County Government, each committee will contact and report to the sub-county water office in charge. Committees can easily express themselves and have good relationships with the sub-county water offices. The measures to be taken when problems occur are as follows. (1) For issues that can be handled by each committee will be handled by the committee. (2) For issues that cannot be dealt with by the committee and can be resolved by the technical staff of the Baringo County Government, technical staff of the Baringo County Government will respond. (3) For specialized issues such as pump repair are required, the pump supplier is being asked for

repair. Since repair of pumps requires large repair costs, and in many cases the costs cannot be covered by the committees, support from the Baringo County Government is required. (Refer to “3.4.3 Financial Aspect of Operation and Maintenance” below.)

In light of the above, currently, there is a partial shortage of technical staff in charge of operation and maintenance in the Baringo County Government. To ensure appropriate operation and maintenance of this project and to secure sustainability of the effects of the project, number of staff needs to be increased. For this reason, some minor problems have been observed in terms of the institutional/organizational aspect of operation and maintenance.

### 3.4.2 Technical Aspect of Operation and Maintenance

All technical staff of the Baringo County Government (including the sub-county water offices) in charge of operation and maintenance have bachelor’s degrees in water engineering or electrical engineering or graduated from vocational schools in these areas. Those who have accumulated sufficient skills and experiences in the operation and maintenance of water supply facilities, power generation facilities and electricals are deployed. (According to interviews with the Baringo County Government, more than 95% of technical staff have been working for more than 20 years.) Currently, veteran technical staff are available, however, hiring and training of young staff will be required from the viewpoint of ensuring sustainability of the organization and institution, and training by OJT is assumed for young staff.

In the soft component of this project, training and technical transfer were conducted by the project consultants in two pillars: “improvement of capacity of water office staff to support residents” and “formulation of water user associations by local residents and enhancement of their operation and maintenance capacity”. As regards the former, the acquired skills have been shared with other technical staff in the Baringo County Government and are utilized for local resident support activities regarding daily operation and maintenance at the site. In fact, as mentioned above, it was confirmed during the project site survey that the Baringo County Government and each association have established good relationships. As for the latter, water user associations have been established by local residents at all project sites, and about three members from each project site participated in the training (for a week) on how to operate and check the facilities (water tanks, meters, generators, water supply pipes, etc.) on daily basis, how to keep records and books, how to keep water hygienical (how to store water hygienical), how to clean, how to communicate with local residents etc. These trainees have been utilizing these skills in their daily operation. When interviewed with the trainees in the interview survey, all respondents answered that the training was clear and understandable.

For all the water supply facilities where interviews were conducted, records of sales were kept neatly in the notebook every day, and the proceeds were deposited in the bank account. The trainees obtained manuals during the training (how to check the fuel and oil of generators, how to read the water level, etc.), and the operators refer to the manual as necessary when problems occur. There were some communal faucets where operators referred to the maintenance checklist (from the aspects of technical, organizational, water resources, knowledge/skills) posted on the wall inside the faucet building.

Therefore, no particular problem has been identified regarding the technical aspect of operation and maintenance.

### 3.4.3 Financial Aspect of Operation and Maintenance

The division of roles of the financial aspect of operation and maintenance is basically as follows. (1) For items that can be paid by each committee will be disbursed by the committee. (e.g., payments to operators and expenditures related to cleaning water tanks, electricity tariff (for commercial electricity), diesel fuel (for generator), minor repairs and simple equipment purchase such as hose pipe etc.) (2) For major repair costs that cannot be paid by the committees (e.g., repair and replacement of pumps etc.) and large-scale repair costs to be incurred in the future will be borne by the Baringo County Government's maintenance costs. As for (1), each water supply facility has employed independent accounting system in principle, and expenditures associated with daily operations are financed from the sales.

Regarding (2) above, operation and maintenance costs are covered by the budget of the Baringo County Government. The necessary operation and maintenance costs are estimated by each sub-county water office of the Baringo County Government, and after scrutinized by the Operation and Maintenance Division of the Water Supply Department of the Baringo County Government Head Office, budget request is made to the Chief Officer of the Baringo County Government. Then, the budget request is submitted to the Member of County Assembly which is the Baringo County Assembly, along with budget requests for other areas besides the County's water sector. After the consultation and approval by the Member of County Assembly and the County Governor, the budget will be allocated to the County Government. According to the Baringo County Government, it is difficult to separate and indicate the operation and maintenance costs solely by the project, thus the operation and maintenance costs of the water supply facilities in the entire Baringo County including the project are shown in Table 8. The actual expenditures have exceeded the budget, and necessary operation and maintenance costs have been covered. According to the Baringo County Government, the budget will be reviewed in the middle of the fiscal year (usually between November and January of the following year) and a supplementary budget will be

allocated according to needs and urgency. In case additional budget is needed, it will be covered through diversion from the investment budget, thus there is no shortage of necessary operation and maintenance cost. (The Baringo County Government allocates the budget for the maintenance in preference to the investment budget of water sector (new development costs for water supply facilities)).

Table 8: Operation and Maintenance Cost of Water Supply Facilities including the Project in the Entire Baringo County

(Unit: Kes.)

Fiscal Year	2016/2017	2017/2018	2018/2019
Budget (Approved Amount as of June of the Previous FY)	5,250,000	7,000,000	10,000,000
Actual Allocation	16,218,600	5,500,000	10,000,000
Actual Expenditure	14,500,000	7,500,000	-

Source: Results from questionnaire survey of the Baringo County Government

Note 1) Fiscal year in Kenya is from July to June of the following year

Note 2) Budget is reviewed in the middle of the fiscal year, and a supplementary budget is allocated according to needs and urgency. (Example: A large difference between the budget and the actual allocation exists for 2016/2017 because major repair of other water supply facilities occurred in the middle of the financial year and a supplementary budget was allocated.)

Note 3) Maintenance budget for the water sector is to be allocated preferentially to the investment budget (new construction costs for water supply facilities), and in case an additional budget is required during the fiscal year, it will be diverted from investment budget.

Regarding (1) above, daily operation and maintenance costs are covered by the water sales. The water at each water supply facility is sold in units of one bucket (= 20 liters), and the tariff is determined by each water user association. When checked the tariff for each facility during the project site survey, the unit price per bucket was 2 to 5 Kes. (Kenyan Shilling), and each water supply facility has hired operators to sell the water. Some associations have increased the tariff to cover the necessary maintenance costs.<sup>20</sup> The collection rate of water tariff varies from 50% to almost 100% depending on the water supply facilities, but the rates between 70% and 80% was the most. According to the interview survey, some residents of poor families do not pay the tariff. It was pointed out that such residents often do not pay the tariff if their livestock came to drink without the owner, and if their children came to fetch

<sup>20</sup> At the initial stage of operation, the tariff was 2.5 Kes. per bucket. However, taking into account the costs of operation and maintenance, some water user associations consulted with the local residents and came up with agreement to raise the tariff to 10 Kes. per 3 buckets.

water. The committee members commented that they would want to increase the collection rate, however, because water is a lifeline, they mentioned that it may be difficult to forcibly collect tariff from the poor families.

For all the water supply facilities where interviews were conducted, records of sales were kept neatly, and the proceeds were deposited in the bank account. As described in the Impacts, “(2) Improvement of Hygiene Awareness” above, most of the water supply facilities have lesser users during the rainy season, so sales also decrease. Each committee is managing expenditures so as to avoid the bank account to become deficit since there are certain expenditures associated with payments to the operator, cost to clean water tanks, electricity tariff (for commercial electricity), diesel fuel costs (for generator) and costs of repair.

In each water supply facility, minor repairs and simple equipment purchase such as hose pipe etc. are covered by expenditures from the sales. However, as for major repair costs such as repair and replacement of pumps etc. and large-scale repair costs to be incurred in the future, villages may not be able to pay depending on the water sales situation. In fact, two water supply facilities that have been suspended due to pump failure will be supported by the Baringo County Government’s maintenance costs. (Now under process of securing budget by the Baringo County Government.)

Therefore, no particular problem has been identified regarding the financial aspect of operation and maintenance.



Sales record notebook (sales ledger)



Inside the communal faucet (well-cleaned)

### 3.4.4 Status of Operation and Maintenance

At the time of ex-post evaluation, 63 facilities out of 70 that have been developed are operating without any problems (90% of the total facilities are under operation). Remaining 7 are out of operation. The causes of suspension are the drop in water level (1 site), pump failure (2 sites), electrical problems (1 site), and insufficient power voltage (3 sites), and the Baringo County Government has been following up with these problems. The Baringo



County Government will investigate the water supply facilities with drop in water level<sup>21</sup> and electrical problems.<sup>22</sup> Both water supply facilities with pump failure<sup>23</sup> need replacement of pumps and the Baringo County Government is in the process of securing the budget. For water supply facilities with insufficient power voltage,<sup>24</sup> Kenya Power, a power transmission and distribution company, needs to upgrade its distribution facilities. The Baringo County Government has requested the company to take actions since the completion of the project, but there is no specific outlook.<sup>25</sup>

When checked during the site survey, all the water supply facilities were well-cleaned every day and were carefully used. For water supply facilities where water demand is particularly high, there are voices requesting for increase in the capacity of water supply pump and water supply tank, as well as pipe water supply to the nearby area. In this respect, water user associations are under discussion.

As regards spare parts, such as pipe fittings etc., which are versatile in all facilities, the Baringo County Government collectively purchases and stores them in its warehouse. Since specifications of electrical equipment vary from facility to facility, the Baringo County Government undertakes procurement procedures and purchases them from the market each time. All spare parts are procured from the domestic market, and the procurement period varies depending on the product and price, which generally takes two weeks to one month. According to the Baringo County Government, there is no particular problem in securing spare parts. Small scale and low-priced items such as hoses are purchased from the proceeds by each water user association. Some associations have constructed a shed for operator to rest and a toilet, which are covered by expenditures from the sales.

Regarding the status of operation and maintenance, there is no specific outlook for water supply facilities with insufficient power voltage, and some minor problems are pointed out at the time of ex-post evaluation.

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<sup>21</sup> According to the Baringo County Government, water supply has been suspended since August 2017 due to drop in water level. When tried to operate the generator during the site survey, it didn't work due to a worn-out battery as it hasn't been running for a long time. The Baringo County Government will investigate the cause of the drop in water level etc.

<sup>22</sup> According to the Baringo County Government, there has been a recent report of malfunction (specific date and month is unknown). Electrical problems are suspected, and the Baringo County Government will do the investigation.

<sup>23</sup> According to the Baringo County Government, one of the two sites has not been operational since February 2018. For the other site, no information was obtained on when the failure had occurred. A crane that lifts the pumps from the well is necessary for replacement, and the Baringo County Government is negotiating with the Baringo County Assembly to secure the budget.

<sup>24</sup> According to the Baringo County Government, there are no problems with the facilities themselves, but they are not operating due to insufficient power voltage. Specific situation of each facility is as follows: one facility operated for about one year from March 2017 to March 2018 but has not been in operation after that, one facility opened and operated only for one month in February 2017, and one facility has never been operational or opened since its completion.

<sup>25</sup> According to the Baringo County Government, all operation and maintenance work has been transferred to the County Government following the enforcement of the Water Law in April 2017. Responsibility for the negotiations with the Kenya Power have also been delegated to the County Government.

Some minor problems have been observed in terms of the institutional/organizational aspect and current status. Therefore, sustainability of the project effects is fair.

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

##### **4.1 Conclusion**

This project constructed deep well water supply facilities in Baringo County with the aim of improving local residents' access to safe drinking water. Realization of sustainable access to safe and stable supply of water is well consistent with the development policy and development needs of Kenya, as well as with Japan's ODA policy. Therefore, the relevance of the projects is high. With regards to project implementation, although the project cost was within the plan, the project period exceeded the plan. Therefore, the efficiency of the project is fair. Regarding project effectiveness, the quantitative effects have achieved the targets for both water supply rate and water supply population. For qualitative effects, the interviews with the local residents confirmed that the project improved their access to water supply facilities, which contributed to the improvement of their labor burden (especially for women and children) to fetch water. Regarding impacts, the availability of sanitary water from the water supply facilities developed by this project has led to the improvement of hygiene conditions of the local residents. In addition, the implementation of the soft component (capacity building program) in this project has largely raised the hygiene awareness of local residents. Furthermore, the project has contributed to the improvement of school attendance and employment rate. Therefore, the project has largely achieved its objectives, and thus effectiveness and impacts are high. No negative impacts on natural environment nor land acquisition have been reported. With regards to operation and maintenance, although no particular problem has been identified regarding the technical and financial aspects, some minor problems have been observed in terms of the institutional/organizational aspect and current status. Therefore, sustainability of the project effects is fair.

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

##### **4.2 Recommendations**

###### **4.2.1 Recommendations to the Executing Agency**

Importance of transferring duties to the next elected committee members of water user association when re-selection of members takes place

At the time of ex-post evaluation, all committee members of water user association were in their first term and it was confirmed that they were actively engaged in the committee activities. While a term of each committee varies from 3 to 5 years depending on the

association, it is crucial to make sure that the first term members transfer their duties to the next elected members at the time of re-election – how to operate and check the facilities, how to keep records and books, how to manage bank accounts, how to keep water hygienical, how to clean, how to communicate with local residents etc. – so that operation and maintenance work should not be affected.<sup>26</sup>

Importance of preparing long-term financial plans and to pool funds for water supply facilities operated by solar or generator

In case the power source is solar or generator, water supply facilities cannot be operated beyond its operating life. Therefore, if continuous utilization of solar or generator is assumed after the operating life, it is important that the Baringo County Government and water user associations pool funds as depreciation every year systematically and procure new power facilities on a timely basis at the end of their operating life so as not to affect the water supply operations.

#### 4.2.2 Recommendations to JICA

None.

#### 4.3 Lessons Learned

Importance of prior investigation and securing collaboration with the power company in order to ensure timely power supply to water supply facilities

In this project, three water supply facilities are not operating due to insufficient power voltage for commercial electricity. The reason is that power supply has not been keeping up due to the increase in power demand in the project area. As a fundamental measure, the Kenya Power should increase power supply and strengthen distribution facilities. While the Baringo County Government has been urging the Kenya Power for appropriate actions, there is no concrete prospect. Given the situation, when deciding power sources to be used, the executing agency should conduct sufficient investigation on local power supply and demand situation (past trends) and capacity of distribution facilities used for the project in advance so as to prevent similar problems for similar projects in the future, when commercial electricity is considered. In addition, the executing agency should make decisions about a selection of power sources after carefully examining the long-term power supply plan and prospects of power supply and demand of the local power company.

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<sup>26</sup> For some water supply facilities with high demand, the Baringo Country Government is considering outsourcing operation and maintenance work to private operating companies in the future.

Importance of preparing agreement documents on the contents and basis of agreement and sharing common understanding between JICA and the executing agency, as regards to the setting of quantitative effects as well as resetting them in the event of modification of outputs

The executing agency could not find the agreement documents with JICA regarding the setting of the quantitative effects of the project and did not have a common understanding with JICA regarding how to derive baseline and target figures. (Specifically, they did not recognize that the “difference” between the baseline and the target would be the target figures for the originally planned 90 sites.) In addition, despite significant reduction of outputs (construction sites for water supply facilities) of this project (sites were reduced from 90 to 70), target figures were not re-examined. For this reason, review of target figures was conducted at the time of ex-post evaluation, however, since the executing agency had a different understanding of setting the target figures with JICA, there was discrepancy in the figures presented by the executing agency. In this regard, as regards to the setting figures of the quantitative effects, it is important that the executing agency and JICA prepare agreement documents to avoid misunderstandings between them so as to properly grasp the project effects and to conduct analysis with common understanding at the time of project monitoring and evaluation etc. In addition (although target figures were not revised and the targets for 90 sites in the original plan were used for the comparative analysis with the actual figures as a result of repeated examinations of the project), in order to grasp objectively to what extent the changes of project outputs have led to the changes in the outcome (project effectiveness), and to carry out more appropriate evaluation judgment, it is important that JICA and the executing agency reexamine the baseline and target figures based on the scope change, and share common understanding between them in the agreement documents in case there are significant changes of project sites for a project consisting of many sites like this project.

End

## Breakdown of Interviewees

	Project Site (Sub-county in parentheses) / Power System * Remarks	Interviewees (All sites include the members of the water user association. Group discussion was conducted)
1	1 Katiborok (North Baringo) / Commercial electricity * High demand	7 men (30s to 50s), 3 women (1 in 40s, 1 in 50s) with a total of 10 people
2	46 Kaptum (North Baringo) / Generator	2 men (1 in 40s, 1 in 60s), 1 woman (in 40s) with a total of 3 people
3	50 Kipkokom (North Baringo) / Commercial electricity * High demand	4 men (all in 40s), 1 woman (in 50s) with a total of 5 people
4	N01. Terik (North Baringo) / Solar * Water supply facility suspended	11 men (4 in 30s, 4 in 40s, 2 in 50s, 1 in 60s), 6 women (2 in 30s, 3 in 40s, 1 in 50s) with a total of 17 people
5	109.1 Oinobmoi Centre1 (Central Baringo) / Commercial electricity	4 men (1 in 30s, 1 in 50s, 2 in 60s), 3 women (3 in 40s) with a total of 7 people
6	123 Siginwo (Central Baringo) / Generator * Water supply facility suspended	4 women (1 in 20s, 1 in 30s, 2 in 40s), 1 man (in 40s) with a total of 5 people
7	130.1 Kakwane (Central Baringo) / Commercial electricity	* Joint interviews conducted in 2 sites 7 men (1 in 20s, 4 in 40s, 2 in 50s), 3 women (1 in 30s, 2 in 40s, 1 in 50s) with a total of 10 people
8	130.2 Kakwane (Central Baringo) / Commercial electricity	
9	51 Kamagonge (Marigat (currently South Baringo)) / Commercial electricity * High demand	2 men (1 in 50s, 1 in 60s)
10	53 Kapsamson (Marigat (currently South Baringo)) / Generator	4 women (2 in 50s, 2 in 40s), 1 man (18 years old) with a total of 5 people
11	58 Catholic (Marigat (currently South Baringo)) / Commercial electricity	2 men (1 in 50s, 1 in 30s), 1 woman (1 in 20s) with a total of 3 people
12	72 Kimalel Hospital (Marigat (currently South Baringo)) / Commercial electricity	3 men (2 in 40s, 1 in 30s), 1 woman (1 in 30s) with a total of 4 people
13	78 Kibingor (Marigat (currently South Baringo)) / Solar * Good practice case	5 men (1 in 30s, 1 in 40s, 1 in 50s, 1 in 60s, 1 in 70s), 2 women (1 in 40s, 1 in 60s) with a total of 7 people
	Total	78 people (49 men and 29 women)

Source: Prepared by the evaluator based on the interview survey

## List of Water Supply Facilities Developed by This Project

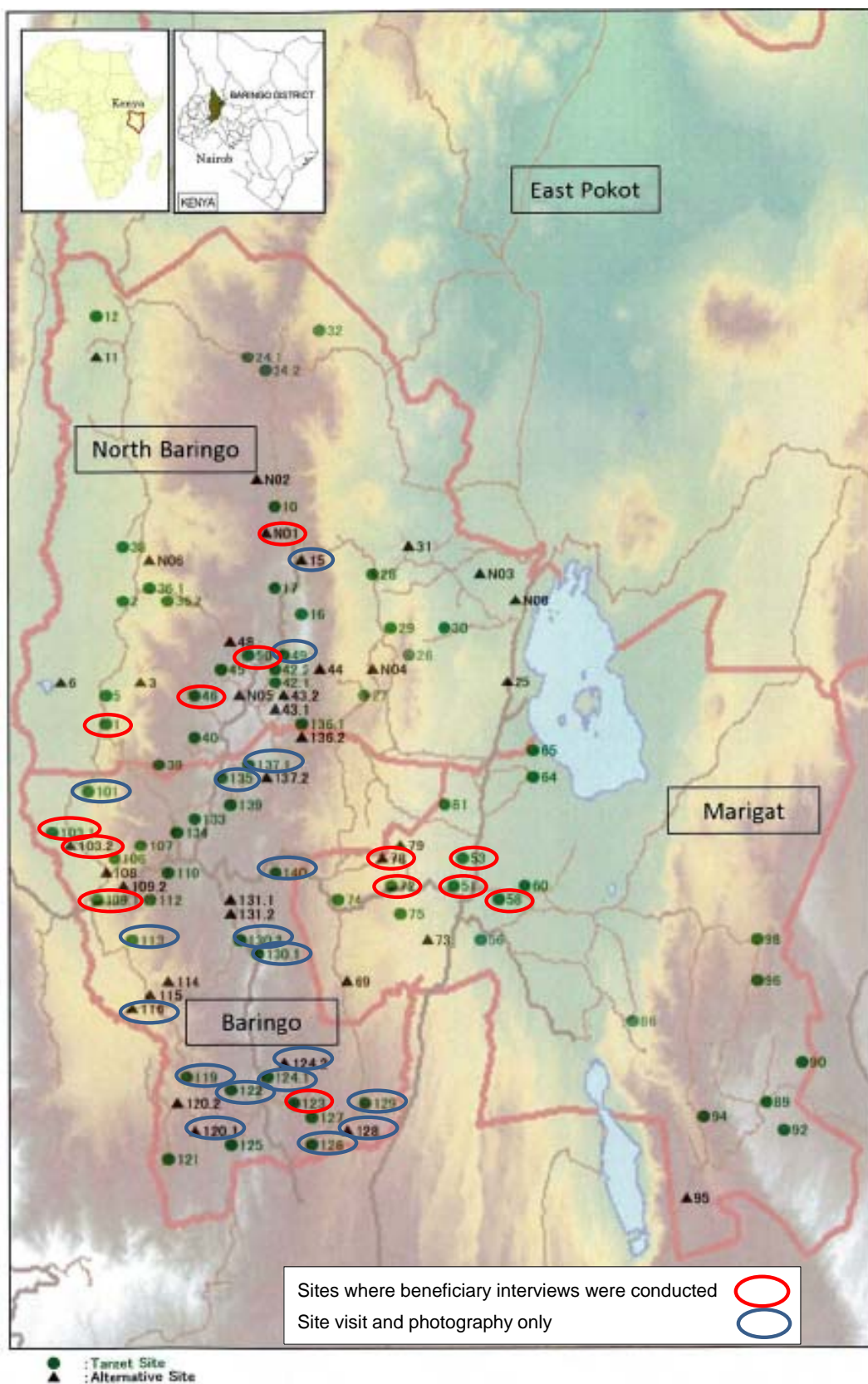
No.	Project Site Number	Project Site	Sub-County	Power System	Remarks
1	1	Katiborok	North Baringo	Commercial electricity	
2	2	Konoo	North Baringo	Commercial electricity	
3	5	Kibuliak	North Baringo	Commercial electricity	
4	11	Katikit	North Baringo	Solar power	
5	12	Ayatia	North Baringo	Solar power	
6	15	Kapamin	North Baringo	Generator	
7	16	Kapkombe	North Baringo	Commercial electricity	
8	17	Chambai Primary	North Baringo	Generator	
9	26	Barkilach	North Baringo	Solar power	
10	27	Usonin	North Baringo	Commercial electricity	
11	28	Kolongotwo	North Baringo	Solar power	
12	29	Koibaware	North Baringo	Solar power	
13	30	Chepkewel	North Baringo	Solar power	
14	31	Kipchemoi	North Baringo	Solar power	
15	36.1	Barwessa-1	North Baringo	Commercial electricity	Suspended (Electrical problems)
16	36.2	Barwessa-2	North Baringo	Commercial electricity	
17	39	Seremwo	North Baringo	Solar power	
18	42.1	Kapchepkor1	North Baringo	Commercial electricity	
19	45	Tiriondonin	North Baringo	Commercial electricity	
20	46	Kaptum	North Baringo	Generator	
21	49	Kureschun	North Baringo	Commercial electricity	
22	50	Kipkokom	North Baringo	Commercial electricity	High demand
23	51	Kamagonge	Marigat (Currently South Baringo)	Commercial electricity	High demand
24	53	Kapsamson	Marigat (Currently South Baringo)	Generator	
25	58	Catholic	Marigat (Currently South Baringo)	Commercial electricity	
26	60	Ndambul	Marigat (Currently South Baringo)	Commercial electricity	
27	64	Longiron	Marigat (Currently South Baringo)	Solar power	
28	69	Kapkechii	Marigat (Currently South Baringo)	Solar power	
29	72	Kimalel Hospital	Marigat (Currently South Baringo)	Commercial electricity	

30	73	Kisamisonchun	Marigat (Currently South Baringo)	Generator	
31	78	Kibingor	Marigat (Currently South Baringo)	Solar power	Good practice (synergy with an NGO)
32	79	Wokerben	Marigat (Currently South Baringo)	Solar power	
33	81	Kabusa	Marigat (Currently South Baringo)	Solar power	
34	86	Samuran	Marigat (Currently South Baringo)	Solar power	
35	89	Mochongoi Centre	Marigat (Currently South Baringo)	Commercial electricity	
36	90	Kapkechir	Marigat (Currently South Baringo)	Generator	
37	92	Kipkandule	Central Baringo	Generator	
38	94	Sambaka	Marigat (Currently South Baringo)	Solar power	
39	95	Nyalilbuch	Marigat (Currently South Baringo)	Commercial electricity	
40	101	Kaptara	Central Baringo	Commercial electricity	
41	103.1	Kakwane	North Baringo	Solar power	
42	103.2	Kakwane	Central Baringo	Solar power	
43	106	Eron Primary	Central Baringo	Commercial electricity	
44	107	Kimoso	Central Baringo	Solar power	
45	109.1	Oinobmoi Centre1	Central Baringo	Commercial electricity	
46	109.2	Oinobmoi Centre2	Central Baringo	Solar power	
47	113	Kasitet	Central Baringo	Commercial electricity	
48	114	Sichei	Central Baringo	Solar power	
49	116	Katunoi	Central Baringo	Solar power	
50	120.1	Mogorwa-1	Central Baringo	Commercial electricity	
51	120.2	Mogorwa-2	Central Baringo	Commercial electricity	
52	121	Kisonei Primary	Central Baringo	Commercial electricity	
53	122	Ochii Primary	Central Baringo	Commercial electricity	
54	123	Siginwo	Central Baringo	Generator	Suspended (Drop in water level)
55	124.1	Tabarin1	Central Baringo	Commercial electricity	High demand
56	124.2	Tabarin2	Central Baringo	Generator	
57	126	Tebei	Central Baringo	Commercial electricity	Suspended (Insufficient power voltage)

58	128	Katkamuma	Central Baringo	Commercial electricity	Suspended (Insufficient power voltage)
59	129	Tinomoi	Central Baringo	Commercial electricity	Suspended (Insufficient power voltage)
60	130.1	Timboiywo1	Central Baringo	Commercial electricity	
61	130.2	Timboiywo2	Central Baringo	Commercial electricity	
62	134	Kiwanja Ndege	Central Baringo	Commercial electricity	
63	135	Pemwai Centre	Central Baringo	Commercial electricity	
64	136.1	Talai-1	Central Baringo	Commercial electricity	Suspended (Pump failure)
65	137.1	Kapkawa-1	Central Baringo	Commercial electricity	
66	139	Serei	Central Baringo	Solar power	
67	140	Turupkir	Central Baringo	Commercial electricity	High demand
68	N01	Terik	North Baringo	Solar power	Suspended (Pump failure)
69	N03	Chemorongio	North Baringo	Solar power	
70	N05	Kalel	North Baringo	Commercial electricity	

Sites where beneficiary interviews were conducted
  Site visits and photography only





Project Site Location Map