Republic of Senegal

Ex-Post Evaluation of Japanese Grant Aid Project

The Project of Supply of Drinking Water in the region of Tambacounda

External Evaluator: Satoshi Nagashima, ICONS Inc.

0. Summary

The objective of this project is to supply sustainable and safe water, and to contribute to the economic sustainability through increasing the number of livestock and reducing hard work by reducing the time to fetch water through renovating and expanding the existing water supply facilities in the target sites mainly in the Region of Tambacounda, Senegal.

The project is consistent with the development policy and the development needs of Senegal and the development policy of Japan, and the relevance is high.

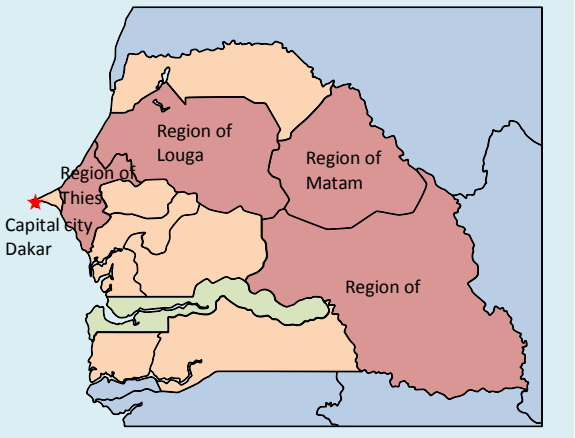
The project cost was lower than planned, but the project period was slightly longer than planned due to security problems in Senegal and efficiency was fair.

Although one of the effect indicators, the "number of people who have access to safe water" in the target area is lower than the target value, all other indicators have been achieved. In addition, there is indication of positive impact such as the increasing number of livestock and the reduction of time to fetch water, and there are also no negative impacts such as environmental effects, etc. Therefore, the effectiveness and the impacts are high.

Concerning the sustainability of the project, human resource is insufficient in administrative organization, especially with regard to Subdivision of Maintenance and Well and Borehole Brigade which are directly in charge of maintenance of water supply facilities, and the budget is also not allocated sufficiently. However, the Boreholes Users Association (Association des Usagers de Forage (hereinafter referred to as "ASUFOR")), which is in charge of the operation and maintenance of the water supply facilities in each target site, functions sufficiently and there is no serious problem. Therefore, the sustainability is fair.

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

1. Project Description



Project Location(s)

One of the renovated water supply facilities in the target sites, Sinthiou Maleme

1.1 Background

The supply of safe water was positioned as one of the main development issues with respect to health and hygiene, and the reduction of poverty by the Government of Senegal, and improving the rate of access to safe drinking water[1] in the rural area to 78% by 2015 was listed in the national policy such as Millennium Development Goals (herein after referred to as MDGs). To achieve this objective, the government of Senegal prepared the "Millennium Program for Water and Hygiene (Programme d'Eau Potable et d'Assainissement du Millénaire (herein after referred to as "PEPAM")) and the administration for water has been implemented in accordance with the policy.

The rate of access to safe drinking water in Senegal was 72% in 2007 (PEPAM) on the national level and the rate in the Region of Tambacounda, where the main project area is , and is located in south east part of Senegal was stagnant at approximately 30%. The Region was known as a poverty area in Senegal and the limited access to safe water, which is the basis of life, was one of the factors for the increasing poverty level in the area.

Japan has continuously conducted grant aid projects for rural water supply since "The Project for Rural Water Supply (1st Phase)" in 1979. However, some of the facilities had not functioned sufficiently as planned due to age. To improve this situation, the Government of Senegal requested a project to renovate and extend the water supply facilities in 19 sites which were mainly the sites of the previous Japan grant aid Projects.

1.2 Project Outline

The objective of this project is to supply sustainable and safe water in the target sites, and to contribute to the economic sustainability through increasing the number of livestock and reducing hard work through the reduction of time to fetch water by renovating and expanding the existing water supply facilities in the target sites, mainly in the Region of Tambacounda, Senegal.

Grant Limit / Actual Grant Amount	1,300 million yen / 1,300 million yen,
Exchange of Notes Date (/Grant Agreement Date)	March, 2010 / March, 2010
Implementing Agency	Ministry of Urban Development, House, Construction and Water (Current Ministry of Water and Sanitation) Department of Rural Water (Current Direction of Water)
Project Completion Date	April, 2012
Main Contractor(s)	Nissaku Co., Ltd.

[1] Rate of population who can access safe water by public fountains or individual taps.

Main Consultant(s)	Japan Techno Co., Ltd.
Basic Design	February, 2010
Detailed Design	November, 2010
Related Projects	Technical assistance projects - Project water for all and assisting community activities (Projet Eau Potable pour Tous et Appui aux Activités Communautaires (hereinafter referred to as "PEPTAC1")) (2003-2006) - Project water for all and assisting community activities Phase 2 (hereinafter referred to as "PEPTAC 2") (2006-2010) - Study on rural water supply in Tambacounda and Matam Regions (2007-2010) - Project for sustainable rural development (2008-2012) Grant-aid projects - Project for rural water supply (1st phase -12th phase) (1979-2000) - Project for rural water supply of eight regional centres (1992-1994) - Project for water supply in rural area (1993-1996) - Project for water supply in rural area, improvement and reinforcement of rural water supply facilities (1994-1999)

2. Outline of the Evaluation Study

2.1 External Evaluator

Satoshi Nagashima, ICONS Inc.

2.2 Duration of Evaluation Study

Duration of the Study: July, 2014 –June, 2015

Duration of the Field Study: 31 August, 2014 - 25 September, 2014

8 February, 2015 – 25 February, 2015[2]

[2] It was carried out at same timing of ex-post evaluation of technical cooperation project "Project for Sustainable Rural Development".

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

3.1 Relevance (Rating: ③[4])

3.1.1 Relevance to the Development Plan of Senegal

At the planning stage of the project, the supply of safe water was positioned as one of the main development issues with respect to "health and hygiene" and "reduction of poverty" by the Government of Senegal and improving the rate of access to safe drinking water in the rural area to 78% by 2015 was listed in the National policy such as the Poverty Reduction Strategy Paper (hereinafter referred to as "PRSP") and MDGs.

At the time of the ex-post evaluation, MDGs were still an important policy for the water sector and an 82% rate of access to safe drinking water in the rural area by 2015 was aimed for. Nationwide, the rate of access to safe drinking water in rural areas reaches 84.1% and the objective has been achieved in December, 2013. In addition, according to the National Strategy for Economic and Social Development 2013-2017 (hereinafter referred to as "NSESD") which is PRSP at the ex-post evaluation stage, increasing access to safe water is positioned as one of the major development issues and target objectives are prioritized. These objectives include increasing access to safe water in the urban or the rural areas via the construction or renovation of boreholes and water tanks, and assisting the sustainable management of water resources through the establishment of community organizations.

For the reasons above, MDGs are still important policy for the water sector in Senegal and is consistent with the project which aims to improve the rate of access to safe drinking water in rural areas. In addition, the important policy after 2015 will be NSESD; it aims at increasing access to safe water the in urban and the rural areas via the construction or renovation of boreholes and water tanks, and assisting the sustainable management of water resources through the establishment of community organizations. There is no change in comparison with previous policy of Senegal and the policy in Senegal is consistent with the project.

3.1.2 Relevance to the Development Needs of Senegal

At the planning stage of the project, the nationwide rate of access to safe drinking water in Senegal was an average of 72% (PEPAM 2007), but the rate of access in the Region of Tambacounda which was a major project target area was 30%. The Region was one of the poorest areas in Senegal and indicators for education and health were also at low levels. Limited access to safe water, which is the basis of life was one of the factors for the increasing the poverty level in the area, and improvement and renovation of water supply facilities had been strongly aimed for. For these reasons, the priority on the improvement of water supply facilities in the Region of Tambacounda, Senegal was high.

According to the latest survey carried out by PEPAM, nationwide the rate of access to safe drinking water in the rural area has been improved to 84.1% but the rate of access in the Region of

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

[4] ③: High, ② Fair, ① Low

Tambacounda in 2013 was still low, though it has improved to 48.3%.

Table 1: Rate of access to safe drinking water in the rural area of each Region of Senegal in 2013

Name of region	Rate of access to safe drinking water (%)
Region of Diourbel	94.9
Region of Ziguinchor	44.1
Region of Kaolack	87.9
Region of Fatick	85.3
Region of Thies	81.4
Region of Kaffrine	86.0
Region of Matam	75.5
Region of Kedougou	11.5
Region of Louga	80.4
Region of Tambacounda	48.3
Region of Sedhiou	24.7
Region of Kolda	18.2

Source: Material provided by PEPAM

Due to the reasons above, the rate of access to safe drinking water in the Region of Tambacounda is 5th from the lowest and still at a low level, and the demand for groundwater development is still high. Therefore, the project is consistent with the development needs of Senegal at the ex-post evaluation stage.

3.1.3 Relevance to Japan's ODA Policy

According to the "Country Assistance Policy for Senegal" prepared in 2009, "water supply" was listed as priority goal in Small Goal II "Improvement of basic social services" in Medium Goal I "Improvement of life for people in poverty in the rural areas". Therefore, water supply was an important development policy of Japan for Senegal, and the project is consistent with Japan's ODA Policy during the planning stage.

<Summary of Relevance> Improvement of access to safe water which the project has aimed is still consistent with the development policy in Senegal at the ex-post evaluation stage. In addition, the rate of access to safe drinking water in the rural area of the Region of Tambacounda, which is the main target area of the project, has been improved from 30% in 2007 to 48.3% in 2013 but it has not reached 82% which MDGs aim to achieve in rural areas, and the development needs are consistent with the project. Furthermore, according to Japan's ODA policy in 2009, water supply was one of the important objectives and the project was consistent with Japan's ODA policy.

For the reasons above, 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

In the project, renovation and extension of water supply facilities (boreholes, water towers, public fountains and other relevant facilities) had been conducted in following 19 sites.

Table 2: Name of target sites in the project

Name of Region	Name of Target site
Region of Tanbacounda	Sinthiou Malame, Darou Ndiawene, Diagle Sine, Maka, Colibantang, Meleto, Koumpentoume, Hamdalaye Tessan, Goumbayel, Fass Gounass, Darou Salam Sine II, Bidiankoto, Goudiry, Diam Diam, Missirah
Region of Matam	Dounde, Aoure
Region of Thies	Taiba Ndiaye
Region of Louga	Mbayene Thiasde

(1) Output by Japan side

1) Construction of facilities

There was no change between from the planning stage to the actual stage in regard to the numbers of existing boreholes renovated, new boreholes constructed, renovation of water towers renovated, renovation of water tanks renovated, and new water towers constructed. There were some changes in regard to the distance of distribution pipes, numbers of public fountains, watering places for livestock, watering places for vehicles and rooms for managers, etc. These were unavoidable and minor changes due to the results of detailed survey by the contractors during the implementing stage, changes of decisions as whether to renovate or newly construct requests from residents and change of the position, etc., and it was reasonable. Therefore, there is no major change between the planning stage and the actual stage.

Table 3: Comparison between planned facilities during the basic design stage and actual facilities constructed

			Planned	Actual
Renovation of existing boreholes			10	10
Construction of new boreholes			14	14
Renovation of water towers			20	20
Renovation of water tanks			3	3
Construction of new water towers			1	1
Distribution pipes	New construction		Approx.155km	Approx. 148km
Public fountains	Central villages	Renovation	141	137
		New construction	98	126
	Satellite village	Renovation	37	20
		New construction	51	55

Watering place for livestock	Renovation	32	35
	New construction	11	9
Watering place for vehicle	Renovation	19	15
	New construction	2	6
Room for machine	Renovation	17	17
	New construction	4	4
Room for manager	Renovation	16	18
	New construction	3	1
Toilet	Renovation	16	16
	New construction	3	3
Installation of submergible pump		24	24
Power source	Generator	24	24
	Commercial electricity	5	5

Source: Materials provided by JICA

Renovated watering place for livestock in Mbayene Thiasde

Newly constructed watering place for vehicle in Goumbayel

2) Soft component

Sites were categorized and the soft component activities were planned depending on the capacities of ASUFOR, which is in charge of operation and maintenance of water supply facilities, and sites were found to be: those in which the operational status was good (four sites); those in which there were some problems in regard to operation (eight sites); and, those in which the sites which ASUFOR would be newly established (seven sites). Operational status was re-categorized during the implementing stage and the number of sites in which the operational status was good became three, the number of sites in which there are some problems in regard to operation became twelve, and the number of sites in which ASUFOR would be newly established became seven. That was the only change and other activities were conducted as planned.

(2) Output from Senegal side

Output from Senegal side was conducted as planned and there was no change from plan.

1) Securing of land and the levelling

2) Ensuring personnel for utilising the procured facilities and equipment

3) Implementing necessary input for smooth implementation of the project

4) Cooperation of the soft component program activities by the Well and Borehole Brigade and

representative in target sites

5) Introduction of measured rate system for water utilization after completion of constructing the water supply facilities, and monitoring

3.2.2 Project Inputs

3.2.2.1 Project Cost

Concerning the project cost, 1,299 million yen was estimated in the planning stage. The actual project cost became 1,241 million yen which is lower than planned (96% of planned). The reason for reducing the project cost is that the bid amount during the tender for the project was lower than the planned amount.

For the reason above, the project cost was lower than planned.

3.2.2.2 Project Period

Concerning the project period, total 24 months were estimated in the planning stage but the actual project period became 25 months due to the one month delay of the completion of the soft component activities (104% of that planned). However, the reason was that the security was degrading due to implementation of presidential election in Senegal and it was forced to postpone the implementation of the soft component activities.

For the reason above, the project period was longer than planned.

<Summary of efficiency> For the Outputs of the Project, there were minor changes in regard to construction between the planning stage and the actual stage but there were no major changes in total, and the changes were reasonable. In addition, the other Outputs, such as the soft component was carried out as planned. Furthermore, concerning the Input, the project cost was 96% of that planned but the project period was 104% of planned.

For these reasons, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[5] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) Operation indicators

None

(2) Effect indicators

Following effect indicators were set on access to safe water for the project.

[5] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 4: Comparison between the target value and the actual value of the rate of access to safe water at the target year in the target area

	Baseline	Target	Actual	
	2009	2014	2012	2014
	Baseline Year	2 Years After Completion	Completion Year	2 Years After Completion
Number of people who can access safe water	0	126,540	119,280	119,650
Number of people who can limitedly access safe water	82,430	0	0	6,890
Number of people who cannot access safe water	26,670	0	0	0

Source: Documents provided by JICA

Note: According to the result of the estimation, it was found that the target value which was set for 2014 did not consider population growth rate in material provided by JICA (because the increase in the population was less than 1% during six years). Therefore, the target value was reset and modified.

For the number of the beneficiaries and the indicators regarding the rate of access to safe water, an effort was made to obtain the statistical information to confirm long term changes but such information did not exist. In the basic design period, the number of beneficiaries was estimated as the number of people obtained during the basic design period, multiplied by 3%[6], which was the population growth rate of design criteria in the Direction of Water. Therefore, comparison was made by using same method. According to the survey, it was found that:

1) There was a water quality problem in Colibantang (water colour became red due to iron content) and population cannot utilize it as drinking water;
2) Water was not sufficiently distributed to the satellite villages of Koumpentoum due to insufficient water pressure;
3) Part of the public fountain was not utilized in Hamdalaye Tessan and Missirah, thus it was confirmed that only a portion of the population has limited access to safe water in these sites.

Therefore the rate of access to safe water in the target sites was slightly less than target value (95%), but it has been almost completely achieved. In addition, there were some problems in regard to the water supply facilities and that the number of people who have limited access to safe water was slightly higher than the target value of zero. It has been achieved the indicator of number of people who cannot access safe water as the target value of zero.

[6] This is from the basic design report of the project. According to the general census for population, housing, agriculture and livestock by the national agency of the statistics and demography, growth rate of population from 2002 to 2013 is 2.5% and the estimation has evidence.

For the reasons above, expected objective has been almost achieved though actual value was slightly less than the target value.

In addition, according to the beneficiary survey conducted by a local consultant[7], it was found that there was an increase in the consumption of water by each household after implementation of the project in all seven surveyed sites (minimum 128.1%. maximum 358.7%).

Table 5: Average of water consumption per household according to the beneficiary survey

Unit: L/day

	Before implementation	After implementation	Increasing rate
Koumpentoume	241	454	188.4%
Diam Diam	304	518	170.4%
Bidiankoto	147	417	283.7%
Goumbayel	327	780	238.5%
Aoure	138	495	358.7%
Mbayen Thiasde	395	506	128.1%
Taiba Ndiaye	338	481	142.3%

Source: Beneficiary survey

3.3.2 Qualitative Effects

(1) Existing water supply facilities which were in disuse have become usable by the construction of new boreholes.

According to site survey of water supply facilities in 19 target sites, all water supply facilities were available except a borehole renovated in Koumpentoume (a borehole which was newly constructed in Koumpentoume functions properly). Therefore, new boreholes function 100% and renovated boreholes function 92.9% out of 10 of new boreholes and 14 renovated boreholes respectively. Most water supply facilities are currently available and the outcome of the project appears sufficient.

(2) ASUFOR is newly established, or the activities are revitalized due to the implementation of the soft component activities

Classification of sites according to the "question items for judgement of the activity level of ASUFOR"[8] is as follows.

[7] Seven site were selected from the target sites and a questionnaire survey was conducted for 50 sample each (350 samples in total) Total respondent was 350 and the percentage of sex was 217 male (62%) and 133 females (38%) and the percentage of age composition was four of teen age (1%), 49 of twenties (14%), 88 of thirties (25%), 80 of forties (23%), 62 of fifties (18%), 45 of sixties (13%) 17 of seventies (5%) and five of eighties (1%).

[8] Basis to judge the capacity or activity level prepared in the technical cooperation project PEPTAC implemented in Senegal

Table 6: Classification of site according to the question items for judgement of the activity level of ASUFOR during the period of implementing soft component and the period of ex-post evaluation

	Before implementing the soft component	Ex-post evaluation
Class A*	3	16
Class B	12	3
Class C	4	0

*This is a classification of ASUFOR defined during the soft component portion of the project:
Class A: ASUFOR has been already established. More than 10 of the question items have been achieved and the ASUFOR is judged as excellent,
Class B: ASUFOR has been already established. The question items have been achieved less than 10 and the ASUFOR is judged that there is some problem,
Class C: ASUFOR has not been established and the water supply facilities are managed by ex-water management committees system.

Source: Result of interview survey for ASUFOR

For the reason above, many target sites had problems before implementing the soft component activities of the project, however 16 sites became excellent at the time of ex-post evaluation. Compared with before implementing the soft component activities, significant improvement has appeared. Therefore it is evaluated that ASUFOR has been newly established and is functioning, or the existing activities of ASUFOR have been revitalized due to the implementation of the soft component activities.

3.4 Impacts

3.4.1 Intended Impacts

(1) Increase the number of large or small livestock by increasing access to safe water

Increasing the number of large or small livestock was expected by increasing access to safe water as shown in Table 7 below during the basic design study.

Table 7: Indicators on number of livestock

	Before implementation of the project (2009)	Expectation after completion of the project (2012)
Number of large livestock	44,575	44,843
Number of small livestock	67,700	68,107

Source: Material provided by JICA

However, according to the interview with the consulting company which was in charge of conducting the basic design study, the number of livestock used in the indicator was based on a result of an independent socio-economic survey at the target sites and was not the result of official statistics.

Though effort was made to collect existing statistical information at Regional Department of

Livestock in the Region of Tambacounda, the first livestock inventory was prepared in 2013 and it was impossible to compare with the previous data. In addition, the unit of the statistic was not village level but Rural Community[9] level and it was difficult to compare with the target value. According to the interview survey with the Regional Department of Livestock, number of livestock grows 3% per year and one of the factors is sustainable water supply. Due to the reasons mentioned above, interview survey was carried out with ASUFOR members at each target site and the situation of increase or decrease of livestock was confirmed qualitatively.

Table 8: Increase or decrease of number of livestock at each target site based on the interview survey

Contents of interview survey	Number of sites
Number of livestock has increased due to sustainable access to water	13
Number of livestock has increased but water source is not the water supply facilities of the project	1
There is no change	3
Number of livestock has decreased	2

Source: Interview result with ASUFOR

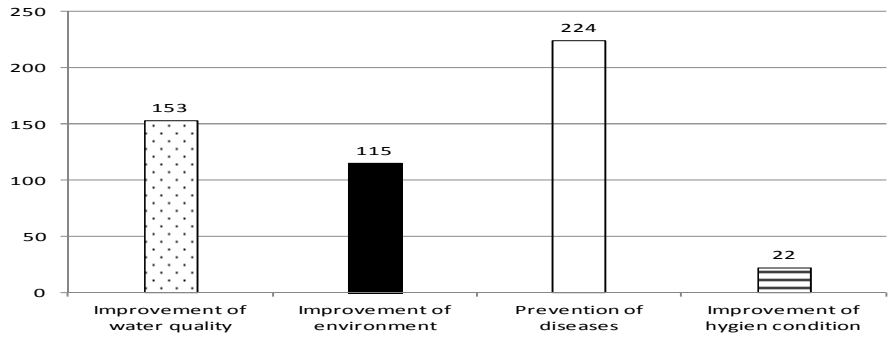
According to the interview survey, the number of livestock has increased in many target sites due to sustainable water supply. As a result of this, people can easily sell the livestock and cope with sudden situations such as marriages, sicknesses and festivals, etc., and their life became economically sustainable.

(2) Effect for health (decrease of water borne diseases)

Before implementing the project, it was considered that water borne diseases would decrease via sustainable access to safe water through implementation of the project.

According to the beneficiary survey, approximately 70% of respondents in total answered that diarrhea or malaria has been decreased at the target sites and it was confirmed that there is a decreasing tendency of diarrhea or malaria compared to before the project was implemented. However, the reasons for the answer were also asked. Beneficiaries realised that the improvement was caused not only by the improvement of water quality but also by combined effects such as improvement of environment and prevention of diseases, etc. Therefore, though it is due to the combined effect, the project partly contributes to decrease water borne diseases.

[9] "Rural Community" was previous local administrative division in Senegal and was organizations to govern villages under Prefectures, Departments and Regions. Due to the policy change of decentralization in Senegal in 2014, administrative division under Prefectures was rearranged as "Commune" and "Rural Community" was abolished and has not existed at present.



Unit: person

Figure 1: Reason of decreasing water borne diseases by beneficiaries (There are multiple answers)

(3) Shortening time for fetching water and the reduction of hard work from women or children

Before implementing the project, shortening time for fetching water and the reduction of hard work was expected.

Time for fetching water before and after implementation of the project which beneficiaries consider is as following figure.

More than half of all beneficiaries who responded said that it took more than 20 minutes to fetch water before implementation of the project. However, more than half of all beneficiaries who answered said that it took 3-10 minutes to fetch water after implementation of the project.

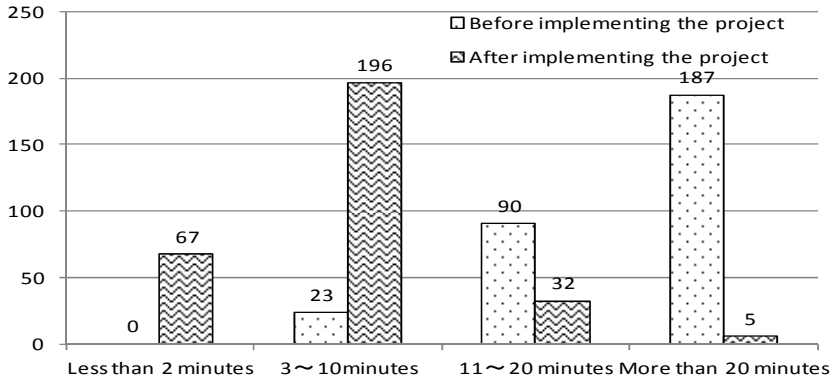


Figure 2: Time to fetch water by beneficiaries before and after implementation of the project

Tendency of reduction of time for fetching water is grasped from the result of the beneficiary survey and impact on reduction of hard work through shortening time of fetching water is confirmed.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

There was no positive or negative environmental impact.

(2) Land Acquisition and Resettlement

Concerning the resettlement, according to the interview survey with the Direction of Water, Ministry

of Water and Sanitation and a questionnaire survey with the consultant which was in charge of supervising of implementation of the project, it was confirmed that there was no resettlement and land acquisition in the project.

(3) Unintended Positive/Negative Impact

None

<Summary of effectiveness and impact> Concerning effectiveness, the “number of people who can access safe water” in the target sites has reached 95% of target value and “number of people who cannot access safe water “has reached zero which is the target value. In addition, average water consumption per household has significantly increased. Concerning the impacts, positive impacts have appeared such as the increasing number of livestock and shortening the time or fetching water, and there was no negative impact contrarily.

For the reasons above, this project has largely achieved its objectives. Therefore effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

1) Institutional aspects of Operation and Maintenance for water supply facilities

According to the soft component plan for reinforcing operation and maintenance at basic design stage, it was hoped that operation and maintenance could be achieved by establishing ASUFOR and raising awareness about operation and maintenance in areas where ASUFOR had not been introduced. In addition, ASUFOR was categorized depending on the level of activity in the sites where ASUFOR had already been established, and it was planned that the soft component activities were to be carried out depending on the problems found by ASUFOR.

According to the interview survey in 19 of the target sites, it was confirmed that ASUFOR had been established and existed in all sites for operation and maintenance of water supply facilities at the time of ex-post evaluation. Therefore, there is no change from the planned institutional system (sharing of responsibility). Sixteen (16) ASUFOR out of 19 were judged as class A by the question items for judgement of the activity level of ASUFOR and the sound management was confirmed.

On the other hand, it was also found that operation and maintenance system have not functioned sufficiently in three ASUFOR (Koumpentoume, Hamdalaye Tessan and Missirah) at the time of ex-post evaluation. The reasons which these ASUFOR did not function well were;

a) Degradation of service due to malfunction of water supply facilities and worsening of the financial balance cause by high electricity bills (Koumpentoume)
b) Rejection of the water fee payment by residents due to unclear management of a part of the

ASUFOR members (Hamdalaye Tessan)[10]

c) Resignation of most of ASUFOR members who could not have any financial incentive and lost their interest (Missirah)[11]

Concerning items b) and c), the prefectural government has already decided to re-elect the ASUFOR member.

For these reasons, there is no major problem on institutional aspect of operation and maintenance for water supply facilities because sound management was confirmed in 84.2% of the target sites.

2) Institutional aspects of Maintenance at administration level

At the time of ex-post evaluation, institutional structure of maintenance of water supply facilities at administration level is as follows.

Table 9: Institutional structure for maintenance of water supply facilities at administration level

Level	Institutional structure at administration level at the planning stage	Institutional structure at administration level at the ex-post evaluation stage	Major tasks at the ex-post evaluation stage
Central level	Direction of Exploitation and Maintenance, Ministry of Urban Development, Housing, Construction and Water	Office of rural boreholes in Senegal (Office des Forages Ruraux du Senegal (OFOR)), Ministry of Water and Sanitation	- Support to outsource maintenance of Water supply facilities to private sector
Regional level	Sub-division of Maintenance, Direction of Exploitation and Maintenance, Ministry of Urban Development, Housing, Construction and Water (three in the whole country) Region of Louga, Kaolack and Tambacounda	Sub-division of Maintenance, Direction of Water, Ministry of Water and Sanitation (three in the whole country) Region of Louga, Kaolack and Tambacounda	- Major repair and replacement of water supply facilities (Replacement and repair pump, air lift, replacement and repair of generator) - Maintenance education
Local level	Department Regional of Water, Ministry of Urban Development, Housing, Construction and Water (15 in the whole countries)	Department Regional of Water, Ministry of Water and Sanitation	- Coordination work due to decentralization
	Well and Borehole Brigade, Direction of Exploitation and Maintenance, Ministry of Urban Development, Housing, Construction and Water (15 in the whole countries)	Well and Borehole Brigade, Direction of Water, Ministry of Water and Sanitation (16 in the whole country)	- Minor repair of water supply facilities - Training and awareness raising activities for ASUFOR at village

Source: Interview survey with Direction of Exploitation and Maintenance (during the 1st survey) and

[10] However, the evaluator visited the site again during the 2nd survey and it was confirmed that re-election of ASUFOR had been carried out and population had started to pay water fee.

[11] Normally ASUFOR members work without payment but there was a misunderstanding in Missirah that they could have some financial incentive if people became ASUFOR members.

OFOR

Number of staff who are in charge of maintenance work of water supply facilities at the target area is as follows.

Table 10: Number of staff who is involved for maintenance works of water supply facilities at administration level

Organization	Region	Formal staff	Contracted staff	Facilitators
Subdivision of Maintenance	Tambacounda	2 (5)	3 (5)	-
	Louga	11 (14)	17 (14)	-
Well and Borehole Brigade	Tambacounda	2 (3)	2 (6)	- (3)
	Goudiry	1 (3)	3 (2)	1 (3)
	Matam	1 (3)	7 (4)	0[12] (2)
	Linguere	2 (4)	12 (8)	3 (4)
	Thies	1 (3)	6 (10)	1 (1)

*Brackets are actual number during the basic design survey in August 2009

Source: Result of interview survey, basic design study report

Compared to the time of completion of the project, the operational segregation has been changed at the central level. The Government of Senegal aims to conduct operation and maintenance of water supply facilities in rural areas by private operators, and have established Office of Rural Boreholes in Senegal (Office des Forages Ruraux du Senegal (hereinafter referred to as "OFOR")) for carrying out its management, and a part of the organization of the Direction of Exploitation and Maintenance was absorbed into it in January 2015.

Transition of operation and maintenance system of water supply facilities to private operators will be started from the central area (such as the Region of Dakar and Thiés) around the second half of 2015 and it will be gradually expanded nationwide after two to three years. For a few years, operation and maintenance by private operators and current ASUFOR operation and maintenance will be used in parallel as shown in Figure 3. In the area where OFOR has not introduced privatization, Subdivision of Maintenance and Well and Borehole Brigade will continue current operations under the Direction of Water.

In the future, the privatization system will be introduced all regions and all the tasks which Subdivision of Maintenance and Well and Borehole Brigade have currently carried out will be taken over to private operators and Subdivision of Maintenance and Well and Borehole Brigade will be

[12] NGO dispatches a volunteer and carried out awareness raising.

abolished and ASUFOR will exist only as a representative of the water supply organization for the village. OFOR will perform supervision of private operators that have been entrusted with the operation and maintenance of water supply facilities. However, the Government of Senegal will continuously take charge of the cost of large-scale construction work such as the renovation of boreholes.

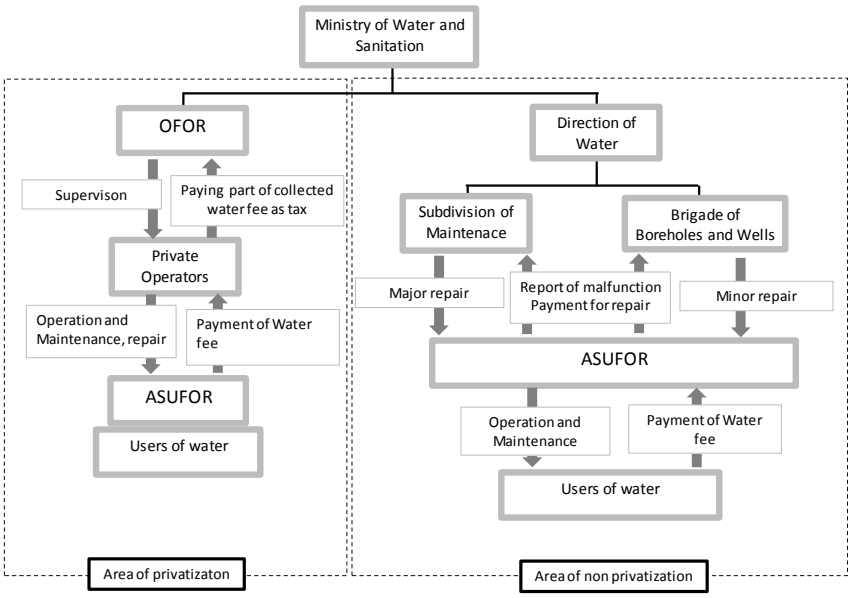


Figure 3: Plan of implementation system for operation and maintenance of water supply facilities at the time of ex-post evaluation

The number of personnel in the Subdivision of Maintenance and the Well and Borehole Brigade has been significantly cut back compared with August 2009 and it is difficult to say that sufficient personnel are assigned to cover the areas for which they are responsible. As the reason for not assigning enough personnel to Subdivision of Maintenance and Well and Borehole Brigade, it is seen that OFOR has been established and Subdivision of Maintenance and Well and Borehole Brigade will be abolished in the future after the privatization of operation and maintenance of water supply facilities.

For the reasons above, operation and maintenance system at water supply facilities do not have any problem at the time of ex-post evaluation, but it can be said that the maintenance system at the administrative level has some small problem. However, the Government of Senegal has already started for improvement initiatives.

3.5.2 Technical Aspects of Operation and Maintenance

1) Technical level of ASUFOR

At the time of planning stage, there were some sites where there was water supply facility but ASUFOR had not been established. For these sites, it was necessary to conduct an awareness raising

for teaching the significance of ASUFOR, the method of the establishment and the concrete activities, etc., encourage the village side sufficiently and establish an operation and maintenance system. In addition, even in some sites where ASUFOR have been already established, the policy of ASUFOR has not been perfectly observed such as payment based on measured rate system or announcement of the activities for population.

At the time of the soft component activities, there were only three sites that were evaluated as excellent (Class A) which passed the question items for judgement of the activity level of ASUFOR more than 10 items; these were Mereto, Taiba Ndiaye and Goumbayel. However, 16 sites have become excellent sites (84.2%) as shown in the results of the survey of 19 sites at the time of the ex-post evaluation.

At the time of ex-post evaluation, measured rate system and preparation of monthly accounting documents have been performed in almost all the sites, and it was confirmed that it has been well established in the target sites. On the other hand, many sites have not conducted 100% collection of water fee and holding regular monthly board committee, etc.

As described above, the number of sites that have problems is a minority and it was confirmed that most of ASUFOR function without any technical problem.

2) Technical level of administrative organization

Before the implementation of the project, most of the personnel in the Direction of Exploitation and Maintenance, Subdivision of Maintenance and Well and Borehole Brigade had conducted mainly repairs of pumps and generators based on the experts in civil engineering and sanitary engineering, and had also been directly involved in the villages and performed the soft component activities such as awareness raising of sanitary concepts and promoting the establishment of participatory management body. In addition, in response to full-fledged decentralization on operation and maintenance of water supply facilities initiated from the mid-1990s, transferring of authority to the local government and support for providing facilities and equipment of regional offices, etc., had been carried out by other donors and Japanese technical cooperation project “PEPTAC1 & 2”. At the same time, capacity development of human resources was also underway, and the technical level had gradually improved, even though the technical level was insufficient at that time to practice the establishment of the operation and maintenance system in the village and to support for strengthening the capacity.

According to the interviews at the time of the ex-post evaluation, though OFOR is newly established organization, it was founded by absorbing the previous Direction of Exploitation and Maintenance and it is considered that the technical level of work implementation does not change and there is no problem.

According to interviews with Subdivision of Maintenance, there is no problem to perform major repair which Well and Borehole Brigade cannot deal with. Therefore, it is considered that the Subdivision of Maintenance have adequate technical ability to implement their task.

In addition, according to interviews with the Well and Borehole Brigade, one person has been

assigned at most from the Well and Borehole Brigade and it can be considered the capacity of Well and Borehole Brigade = capabilities of the personnel (the chief of Well and Borehole Brigade). According to the interview, it was found that some chiefs of the Well and Borehole Brigade have abilities of welding, electrical work and pluming work. However, some chiefs do not have such techniques and the Chiefs in the Department of Tambacounda is also in charge of repairing the facilities in the Department of Goudiry (the works are carried out by only one person for 156 facilities in the Department of Tambacounda and for 63 facilities in the Department of Goudiry). Furthermore, in terms of technical assistance for establishment of operation and maintenance system in the villages and capacity building for ASUFOR, Well and Borehole Brigade are not able to perform regular visits due to the budget constraints and it is not possible to take proactive measures before malfunction of the facilities, and the chief of Well and Borehole Brigade only visits when a malfunction occurs. Therefore, it is considered that there are technological capabilities for performing operations for Well and Borehole Brigade. However, personnel assigned are small in comparison to the range of the task, it is difficult to conduct regular visits to ASUFOR, and there is a problem of the implementation system not being able to perform the techniques sufficiently.

For the reasons above, no problems are observed for the technical capabilities of ASUFOR that perform the operation and maintenance of the water supply facilities. In addition, there is no major problem on the technical level for OFOR (ex Direction of Exploitation and Maintenance), Subdivision of Maintenance and Well and Borehole Brigade, but there is a problem on implementation system in that assigned personnel is too small.

3.5.3 Financial Aspects of Operation and Maintenance

1) Financial aspects of operation and maintenance for water supply facilities

At the time of the basic design study, it was planned that the water fee will be paid by a measured rate system (fee that is converted to per $1m^3$ units). Residents can pay maintenance costs because the willingness to pay is a value obtained from social conditions survey and willingness to pay per $1m^3$ of water was lower than the water fee (amount which maintain the facility per $1m^3$) in any of these sites during the social conditions survey. However, ASUFOR had to secure the financial resources for monitoring and repair by them and it had been assumed that there was a possibility to stop the water supply in some villages which are not able to secure the necessary expense.

According to the interview survey results on the annual expenditure and current bank balance of ASUFOR up to 2013, at the time of the ex-post evaluation, ASUFOR in the target sites which do not exceed minimum bank deposit[13] of 500,000 FCFA[14] are only Hamdalaye Tessan and Koumpentoume (89.5% of the target sites exceed 500,000 FCFA of the bank balance).

In addition, measured rate system has been already established as the method of billing water supply

[13] The minimum banks deposit is defined in the question items for judgement of the activity level of ASUFOR prepared by the technical cooperation project “PEPTAC1”.

[14] 1FCFA=approximately 0.5 yen (March, 2015)

fee. In the public fountain, a manager is assigned at each tap and they manage the public fountain voluntary in exchange for a discount in the water supply rate. Furthermore, in the site where personal taps were installed after the project, water supply meters were installed. Although there is always downward pressure of the water supply rate from population, the financial conditions of own ASUFOR were always taken into account at each site and the water supply rates have been set.

For the water supply fee, there is no problem on collection of water fee from public fountains and personal taps though there is sometime delay such as during the rainy season[15] when cash is insufficient. During non-payment, ASUFOR urges payment by stopping water supply. Therefore, 100% of the water fee has been recovered in about 70% of the target sites. The main reason for the unpaid portion is that residents do not pay the water fee for utilization of watering places for livestock and a few people do not pay the fee.

In this way, about 90% of ASUFOR in the target sites are financially sound. Water fees are set properly, the water supply fee is properly collected and about 90% of bank balance of ASUFOR is properly managed.

2) Financial aspects of administrative organizations

The budget of the last three years in the Direction of Exploitation and Maintenance is as follows.

Table 11: Transition of budget for the Direction of Exploitation and Maintenance (at the time of 1st survey) from 2012 to 2014

Unit: million FCFA

	Operation budget	Investment budget
2012	92.4	2,230
2013	29.2	2,680
2014	29.2	2,060

Source: Direction of Exploitation and Maintenance (at the time of 1st survey)

In the Direction of Exploitation and Maintenance, there was the investment budget for the purchase of equipment, installation of water supply meters and personal taps, the amount had not change significantly. On the other hand, the operating budget had been significantly reduced from 2013. It is considered that the budget for the Direction of Exploitation and Maintenance had been reduced gradually due to the establishment of OFOR. Therefore, it is difficult to contribute fully for the maintenance of water supply facilities.

In January 2015, OFOR formally absorbed a part of the organization of the Direction of Exploitation and Maintenance, and currently, the Direction of Exploitation and Maintenance does not exist. For OFOR, the operation and maintenance of water supply facilities will be entrusted to private operators, and it is planning to collect taxes as a part of water supply fee that private operators collect from

[15] In most of the village in Senegal, People earn most of their income for one year to sell agricultural product cultivated in the end of rainy season. Therefore, most of people run out their stock mostly close to the end of the rainy season that agricultural crop is grown.

users.

Budget overview of the Subdivision of Maintenance and Well and Borehole Brigade is as follows.

Table 12: Annual budget of Subdivision of Maintenance and Well and Borehole Brigade

	Annual budget
Subdivision of Maintenance in Tambacounda	2.35 million FCFA/year
Subdivision of Maintenance in Louga	Approx. 2 million FCFA/year
Well and Borehole Brigade in Tambacounda	Approx. 1 million FCFA/year
Well and Borehole Brigade in Goudiry	Approx. 1 million FCFA/year
Well and Borehole Brigade in Matam	Approx. 1 million FCFA/year
Well and Borehole Brigade in Thies	Approx. 1 million FCFA/year
Well and Borehole Brigade in Linguere	Approx. 1 million FCFA/year

Source: Interview with Subdivision of Maintenance and Well and Borehole Brigade

However, ASUFOR is supposed to bear the costs, except in the case of major renovation, etc., and the cost to support the maintenance of water supply facilities is not included in the budget of Subdivision of Maintenance and Well and Borehole Brigade. These budgets are for fuel costs for vehicles, expense for office supplies and others. Therefore, it is impossible to spend fuel costs required to regular visit of sites from the budget situation such as it is, and it is only possible to accommodate to the repair request from each ASUFOR (if repairs are required, ASUFOR has to pay for the fuel cost). Furthermore, it becomes impossible to conduct preventive activity to protect from the malfunction of water supply facilities.
As ownership of Subdivision of Maintenance and Well and Borehole Brigade have been changed in January 2015 from being under the umbrella of the Direction of Exploitation and Maintenance to being under the umbrella of the Direction of Water and it is not known how the situation will change in the future.

For the reasons above, there is no major problem regarding the financial aspect of the ASUFOR for the operation and maintenance of water supply facilities. On the other hand, for the administrative side (Subdivision of Maintenance and Well and Borehole Brigade) which perform the support of the maintenance of water supply facilities, there are big financial challenges and budget constraints.

3.5.4 Current Status of Operation and Maintenance

For the constructed water supply facilities in this project, there is a problem in which a renovated borehole in Koumpentoume is not functional. However, there is no major malfunction so far and problems before implementing the project have already been solved.

<Summary of sustainability> For system of operation and maintenance, there is no problem at the level of community organizations and the target sites, but number of personnel has been reduced at the local level due to the influence of future privatization at the administrative organization.

Especially, human resources are lacking at the Subdivision of Maintenance and Well and Borehole Brigade which are directly responsible to maintain the water supply facilities and existing problems. There is no major problem regarding technical aspects though there is a problem to make the techniques functional. Concerning the financial aspects for the operation and maintenance, there is a lack of budget in the administrative side, and sufficient supports have not been performed, such as regular visits to implement preventative measures. In addition, privatization of maintenance work of the water supply facilities is in the planning stage and it is too early to expect some improvement at the time of ex-post evaluation. In this way, although some problems exist at the administrative side, ASUFOR at each target site is functioning well and major problems have not been found in the institutional, technical and financial aspects. As a result, there is no special major problem in operation and maintenance situation of the water supply facilities.

For the reasons above, no major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system for the water supply facilities. However, some minor problems have been observed in terms of institutional, technical and financial aspects on the administrative side which support the operation and maintenance of ASUFOR. Therefore sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to supply sustainable and safe water, and to contribute to the economic sustainability through increasing the number of livestock and reducing hard work by reducing the time to fetch water through renovating and expanding the existing water supply facilities in the target sites mainly in the Region of Tambacounda, Senegal.

The project is consistent with the development policy and the development needs of Senegal and the development policy of Japan, and the relevance is high.

The project cost was lower than planned, but the project period was slightly longer than planned due to security problems in Senegal and efficiency was fair.

Although one of the effect indicators, the “number of people who have access to safe water” in the target area is lower than the target value, all other indicators have been achieved. In addition, there is indication of positive impact such as the increasing number of livestock and the reduction of time to fetch water, and there are also no negative impacts such as environmental effects, etc. Therefore, the effectiveness and the impacts are high.

Concerning the sustainability of the project, human resource is insufficient in administrative organization, especially with regard to Subdivision of Maintenance and Well and Borehole Brigade which are directly in charge of maintenance of water supply facilities, and the budget is also not allocated sufficiently. However, ASUFOR which is in charge of the operation and maintenance of the water supply facilities in each target site, functions sufficiently and there is no serious problem. Therefore, the sustainability is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) Urgent improvement of water supply facilities management system of administrative side

As analyzed in the chapter of Sustainability, at the time of ex-post evaluation, there are problems on personnel and financial aspect for Subdivision of Maintenance and Well and Borehole Brigade. Therefore, there is room for improvement such as an increase and budget and personnel for the maintenance system on the administrative side. In order to solve this problem, the Ministry of Water and Sanitation has already founded OFOR to carry out the privatization of operation and management of water supply facilities. It is necessary to rebuild the system for the maintenance of the water supply facilities as soon as possible by implementing the operation and maintenance of water supply facilities through OFOR as planned.

In addition, although the privatization of operation and management is likely to go relatively smooth in the water supply facilities in the central area of Senegal because the area has many users and also has room for financial condition. However, private operators may not show much interest to carry out the operation and maintenance of the water supply facilities in the area where the poor are the majority and access to water supply facilities is difficult, and there is a possibility that introduction of the privatization does not go smoothly. Therefore, it is necessary to consider measures such as the enforcement of introduction, privatization and continuation of existing systems in parallel, allocate the personnel and budget saved in the privatization introduced area to non privatization introducing area.

2) Support for the site where the problem is seen

Currently, due to problems of malfunction of water supply facilities and water quality respectively, sufficient water supply has not been obtained in Koumpentoume and Colibantang. It is necessary that Direction of Water has to consider how to deal with these matters as soon as possible and to take necessary measures such as conducting a field survey and repair, etc. In addition, problems in the management of ASUFOR are seen in Hamdalaye Tessan and Missirah, and it is necessary to cooperate with Prefectural government and Well and Borehole Brigade for solving the problems as soon as possible.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

1) Project planning which thoroughly examines the input from related past projects and their effects, and timeliness of the implementation

Before implementing the project, Japan had continued supports for the water supply sector in Senegal

for many years. In addition, for the purpose of reinforcing the capacity of operation and maintenance of ASUFOR, the technical cooperation projects “PEPTAC1 & 2” have been carried out. In the results of these projects, know-how such as knowledge and experience for organizing ASUFOR has been accumulated for many years in Senegal. These aspects have been utilized for the project formulation and the project design for the implementation of the project and it has led to steady operation and maintenance of water supply facilities by ASUFOR. Thus, it is possible to carry out projects efficiently by timely implementation and continue related projects such as grant aid projects introduced after implementation of the technical cooperation projects and soft components are reinforced.

(2) Importance of developing capacity evaluation criteria of water users association (ASUFOR)

In Senegal, the technical projects “PEPTAC1 & 2” had been carried out for the purpose of capacity building of ASUFOR. In the contents of these, the question items for judgement of the activity level of ASUFOR have been developed to measure the ability as a reference to determine whether ASUFOR functions properly for operation and maintenance of water supply facility, and it is possible to accurately evaluate the current activity and the ability of ASUFOR if it is utilized. In case operational status of such facilities is evaluated, it is useful to develop such an accurate evaluation criteria in advance and it will be possible to be evaluated properly by a third party.

(3) Effect of introducing measured rate system as the national policy for billing method of water supply facilities

In Senegal, efforts have been made for introduction of measured rate system which utilization fee for water supply facilities is paid depends on the used amount of water as a billing system for many years as government policy, a number of projects for water supply sector, including the technical cooperation projects “PEPTAC1 & 2”, and attempts of their dissemination have continued. In the consequence of these achievements, a measured rate system has been established with respect for payment of the water supply fee even in the rural area of Senegal. In the soft component activities of the project, the measured rate system has been taught as the payment system. When the measured rate system has been introduced, ASUFOR can not only collect sufficient cost for operation and maintenance from the users, but the life of water supply facilities can also be extended by not using excess water. However, according to the ex-post evaluation results of other countries, there were some cases in which it was difficult to introduce a measured rate system at individual sites due to opposition from many residents who utilize much water. Therefore, it is necessary to consider introducing the measured rate system at all sites as the national policy.

End