

**DATA COLLECTION SURVEY
ON
THROUGH MANAGEMENT
IMPROVEMENT SUPPORT
BASED ON CLUSTER STRATEGY
FOR
SUPPORTING THE GROWTH OF
WATER UTILITIES**

FINAL REPORT

FEBRUARY 2025

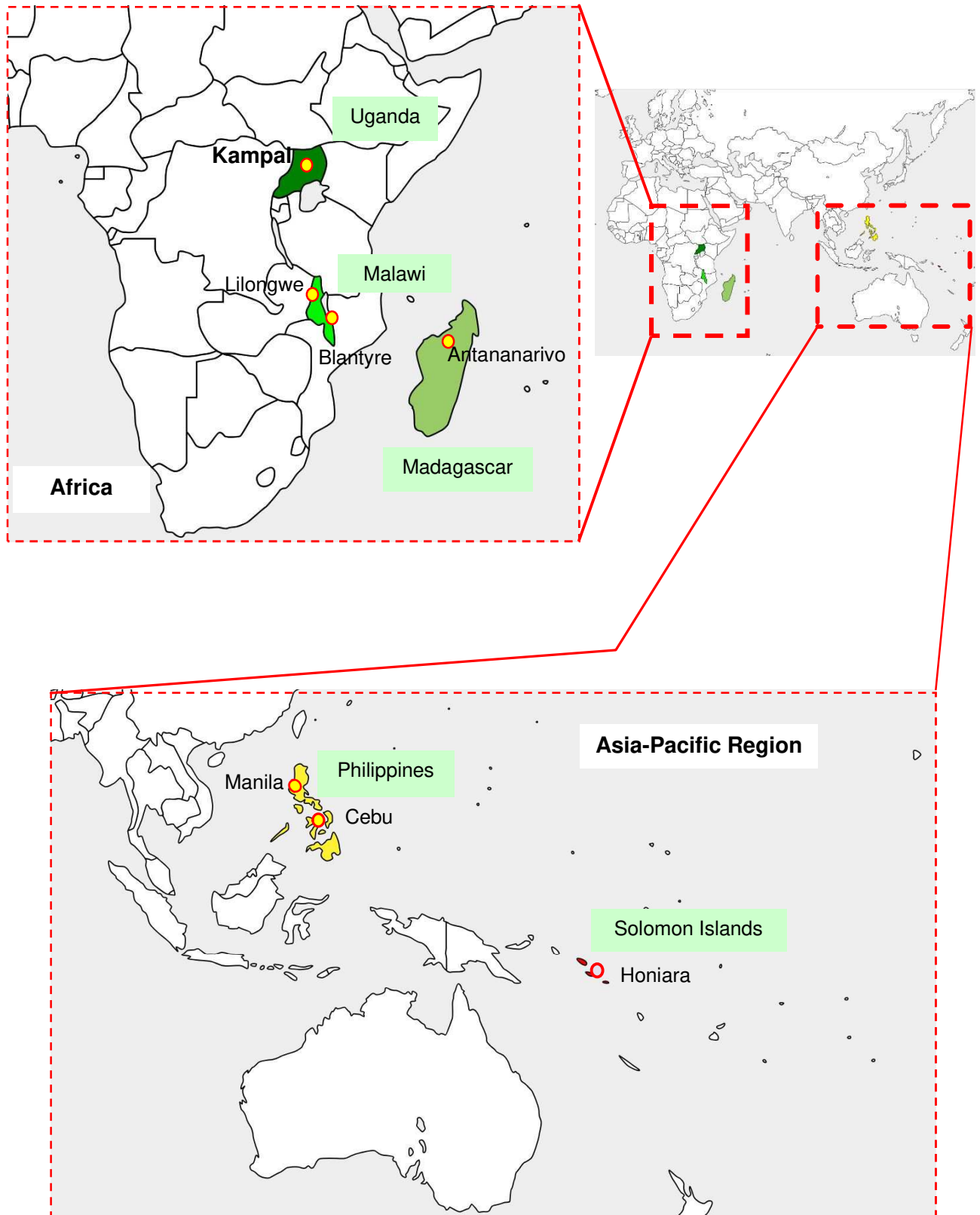
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As of January 2025



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Abbreviations

General:

AC	Asbestos cement
AMR	Automated Meter Reading
BA	Bottleneck analysis
B/S	Balance Sheet
BOD	Board of Directors
CEO	Chief Executive Officer
C/F	Cash Flow
CFO	Chief Financial Officer
CL	Commercial loss
COO	Chief Operation Officer
DG	Director General
DMA	District metered area
DP	Development Partner
ERP	Enterprise Resource Planning
FS	Feasibility Study
IFRS	International Financial Reporting Standards
JGA	JICA Global Agenda
KPI	Key Performance Indicator
MD	Managing Director
MNF	Minimum Night Flow
NRW	Non-revenue water
O&M	Operation and maintenance
PAAEP	Projet d'Amélioration de l'Accès à l'Eau Potable (Drinking Water Access Improvement Project)
P/L	Profit and Loss
PIU	Project Implementation
PMU	Project Management Unit
PPE	Project de Promotion de l'Emploi (Madagascar)
PPE	Property, plant and equipment
SCADA	Supervisory Control and Data Acquisition
SCAP100	100% Service Coverage Acceleration Project (Uganda)
SOE	State-owned enterprise

Organizations:

ADB	Asian Development Bank
AFD	Agence Française de Développement (French Development Agency)
AfDB	African Development Bank
ANDEA	Autorité Nationale de l'Eau et de l'Assainissement (The National Water and Sanitation Authority, Madagascar)
ASKİ	Ankara Water and Sewerage Administration
BWB	Blantyre Water Board
BWSSB	Bangalore Water Supply and Sewerage Board
CMWSSB	Chennai Metropolitan Water Supply and Sewerage Board
DAWASA	Dar es Salaam Water and Sewerage Authority

DBP	Development Bank of the Philippines
DENR	Department of Environment and Natural Resources, Philippines
DFAT	Department of Foreign Affairs and Trade, Australia
DJB	Delhi Jal Board (Delhi Water Board)
DPWH	Department of Public Works and Highways, Philippines
DWASA	Dhaka Water Supply and Sewerage Authority
EIB	European Investment Bank
Electra	Electra (Electricity and water company), Cape Verde
EWD	Erbil Water Directorate, Iraq
GJB	Guwahati Jal Board (Guwahati Water Department)
GKMA	Greater Kampala Metropolitan Area
HWD	Halabja Water Directorate, Iraq
JIRAMA	Jiro Sy Rano Malagasy (Electricity and Water Corporation, Madagascar)
JKVA	Jal Kal Vibhag Agra (Agra Water Department)
KWASA	Khulna Water Supply and Sewerage Authority
LGUs	Local Government Units, Philippines
LWB	Lilongwe Water Board
LWSC	Lusaka Water and Sewerage Company
LWUA	Local Water Utilities Administration, Philippines
MCWD	Metropolitan Cebu Water District
MEAH	Ministère de l'Eau, de l'Assainissement et de l'Hygiène (Ministry of Water and Sanitation, Madagascar)
MEF	Ministry of Education and Human Resources Development, Solomon
MFT	Ministry of Finance and Treasury, Solomon
MMERE	Ministry of Mines, Energy and Rural Electrification, Solomon
MNF	minimum Night Flow
MWSS	Metropolitan Waterworks and Sewerage System, Philippines
NWRA	National Water Resources Authority, Malawi
NWRB	National Water Resources Board, Philippines
NWSC	National Water and Sewerage Corporation, Uganda
PAAEP	Projet D'amélioration De L'accès À L'eau Potable De Madagascar (Madagascar National Water Project)
RADEEF	Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Fès (Fez Electricity Water and Sewage Authority, Morocco)
RADEEM	Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Meknès (Meknes Power Water and Sewerage Public Corporation, Morocco)
RWASA	Rajshahi Water Supply and Sewerage Authority
RWASH	Rural Water Supply, Sanitation and Hygiene
SIWA	Solomon Islands Water Authority
SOE	State Owned Enterprise, Solomon
SONES	National Water Company of Senegal
SOREA	Société de régulation de l'Eau et de l'Assainissement (Water and Sanitation Regulatory Society, Madagascar)
SWA	Samoa Water Authority

SWD	Sulaymaniyah Water Directorate, Iraq
VEI	Vitens Evides International
WASA-L	Lahore Water and Sanitation Agency
WASREB	The Water Services Regulatory Board, Kenya
WB	The World Bank
WB	Water Board (Malawi)
WD	Water District
WEUD	Water and Environment Utilities Department, Uganda
WUC	Water Utilities Corporation, Botswana
WURD	Water Utility Regulation Department, Uganda

CHAPTER 1 : OUTLINE OF SURVEY

1. Outline of Survey

1.1. Background and Objectives of this Study

(1) Background of this study

In order to tackle increasingly complex development challenges, JICA has set 20 "JICA Global Agenda (cooperation strategies for global issues)" (JGA) from 2021 and has been strengthening its efforts on priority groups of projects within each JICA Global Agenda as "Cluster Strategies". In the water sector, the cluster strategy for "Supporting the Growth of Water Utilities" was formulated under the JGA "Sustainable Water Resources Management and Water Supply". The cluster is divided into four types of development stages of water utilities (1) human security-oriented support, (2) basic service improvement support, (3) water utility growth support, and (4) sector governance support) and intends to support the growth of water utilities to the next stage by taking a cooperative approach to handle the requirements of each type. The project is divided into the following three types of support.

In order to monitor the impact of cooperation on water utilities to see if they have achieved the next stage of development, the cluster has set 21 monitoring indicators (Table1-1). The data on the 53 utilities that JICA has supported through financial and technical cooperation from the past to the present are organized and classified into developmental stages, which will be used to confirm the impact and to consider the next required cooperation approach. However, there are issues such as the data management capacity of the utilities, and in particular, many of the management indicators are not easily available publicly, so a certain amount of input is required for data collection.

Table1-1 Monitoring Indicators for Cluster Strategy for Supporting the Growth of Water Utilities

Categories	No.	Sub categories	Key Performance Indicators (KPI)
Water service	1	Business scale	Population served / connections
	2		Service coverage / Water coverage (%)
	3		Production capacity (m³/day)
	4	Service level	Continuity of Service (Hrs/day)
	5		Quality of water supplied (Compliance rate: %)
	6		Customer satisfaction (%)
	7		Water supply pressure
Water supply management	8	Prerequisites	Accounting system
	9	Cost-effectiveness	Water tariff level (USD/6m³)
	10		Collection ratio (%)
	11		Non-revenue water (NRW) ratio (%)
	12		Metering ratio (%)
	13		Leakage ratio (%)
	14	Management scale	Turnover from sales (Currency)
	15	Profitability	Net income (Currency)
	16		EBITDA (Currency)
	17		EBITDA margin (%)
	18		Total capital operating margin (%)
	19		Operating Profit Margin (%)
	20	Financial soundness	Equity ratio (%)
	21		Fixed long term conformity rate (%)

Note: The bold text indicates high-priority KPIs that must be monitored

Source: JICA

The growth of water utilities is not something that can be achieved in a short period of time, and JICA has been providing medium- to long-term support while staying close to the utilities, and there are countries and water utilities that have been providing focused support. On the other hand, based on the cluster business strategy and to foster growth more effectively and strategically, it is necessary to take an approach that keeps the largest segment - (2) the Basic Service Improvement Support type - in mind, collects KPI data, considers trends based on KPI analysis, and identifies utilities that can be further supported to advance to the next stage of development.

In addition to the improvement of water supply services, the criteria for the transition from development stage (2) (basic service improvement support) to stage (3) (water utility growth support) is that the utility must have a positive balance in the management indexes. According to the monitoring data, there are many utilities that do not meet the criteria for both water service and management. In addition, many utilities have reached a certain level of service but are unable to move to the next stage due to deficits in income and expenditures.

In order to address the challenges of a financial deficit in management, it is necessary to provide support for management improvement, such as raising tariffs, implementing measures to reduce NRW, and improving the tariff collection ratio. However, many utilities in development stage (2) are unable to identify the root causes (bottlenecks) of their inability to overcome deficits, because they are unable to conduct objective financial analysis.

In view of the above, to contribute to addressing development challenges—including SDG Goal 6—by expanding and improving water services through increasing the number of water utilities that grow under the cluster business strategy, it is necessary to analyze the factors hindering their growth, categorize the issues, and organize approaches for each issue, thereby making it possible to more effectively enhance the impact of development.

(2) Purpose of this study

The purpose of this study is to collect, analyze, verify, and propose the following data and extract lessons learned for the development of water utilities classified in the development stage (2).

- Identifying issues through KPI analysis and analyzing factors that hinder the transition of water utilities to the next development stage.
- Organizing solution approaches and verifying the effectiveness of these approaches as much as possible in the target countries for on-site surveys.
- Considering and proposing necessary support measures.

1.2. Outline of this study and implementation policy

(1) Outline of this study

The survey targets of this study comprise 27 utilities (in 17 countries) of the 53 utilities to be monitored

under the Cluster Strategy " Supporting the Growth of Water Utilities", including 17 utilities in the development stage (2) and 10 utilities not monitored by the Cluster Strategy. The categories of utilities and the survey contents for each category are listed in the Table below.

Table1-2 List of Utilities Surveyed in this Study

Symbol	Country	Abbreviation	Name
Category A: 14 utilities in 7 countries (utilities subject to monitoring indicator data collection)			
A1	India	DJB	Delhi Jal Board
A2	India	GJB	Guwahati Jal Board
A3	India	JKVA	Jal Kal Vibhag Agra
A4	India	CMWSSB	Chennai Metropolitan Water Supply and Sewerage Board
A5	India	BWSSB	Bangalore Water Supply and Sewerage Board
A6	Turkey	ASKİ	Ankara Water and Sewerage Administration
A7	Iraq	EWD	Erbil Water Directorate
A8	Iraq	HWD	Halabja Water Directorate
A9	Iraq	SWD	Sulaymaniyah Water Directorate
A10	Morocco	RADEEF	Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Fès (Fez Electricity Water and Sewage Authority)
A11	Morocco	RADEEM	Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Meknès (Meknes Power Water and Sewerage Public Corporation)
A12	Cape Verde	Electra	(Electricity and Water Company)
A13	Senegal	SONES	National Water Company of Senegal
A14	Botswana	WUC	Water Utilities Corporation
Category B: 7 utilities from 5 countries (utilities for which questionnaire survey and analysis are requested in addition to the information collection in A)			
B15	Samoa	SWA	Samoa Water Authority
B16	Bangladesh	DWASA	Dhaka Water Supply and Sewerage Authority
B17	Bangladesh	RWASA	Rajshahi Water Supply and Sewerage Authority
B18	Bangladesh	KWASA	Khulna Water Supply and Sewerage Authority
B19	Pakistan	WASA-L	Water and Sanitation Agency Lahore
B20	Tanzania	DAWASA	Dar es Salaam Water and Sewerage Authority
B21	Zambia	LWSC	Lusaka Water and Sewerage Company
Category C: 6 utilities from 5 countries (utilities subject to field survey in addition to the contents of A and B)			
C22	Philippines	MCWD	Metropolitan Cebu Water District
C23	Solomon.	SIWA	Solomon Islands Water Authority
C24	Madagascar	JIRAMA	Jiro Sy Rano Malagasy
C25	Uganda	NWSC	National Water and Sewerage Corporation
C26	Malawi	LWB	Lilongwe Water Board
C27	Malawi	BWB	Blantyre Water Board

(2) Implementation policy

The study was conducted based on the following six implementation policies and process (see Figure 1-1).

1) Desktop survey (DS)

- Collect data on Key Performance Indicators (KPIs) for water utilities
- Collect additional data and information through the Internet
- Conduct a questionnaire survey of water utilities for categories B and C

2) Analysis (Diagnosis)

- Diagnose the performance of water utilities in terms of growth spiral
- Identify impediments to the growth spiral
- Propose solutions

3) 1st field survey

- Carry out on-site survey or online interview
- Discuss diagnostic results and solutions with water utilities
- Collect additional data and conduct field surveys regarding local water supply facilities, etc.
- Finalize diagnostic results and solutions
- Create an action plan that can be implemented in a short period of time for the next steps

4) Action plan implementation

- Water utilities will communicate online with the survey team to implement the action plan.

5) Second field survey

- On-site survey or online interview
- Discuss the results of the implementation of the action plan
- Based on the results of the in-depth analysis, more detailed solutions and improvement scenarios will be considered

6) Proposal of support measures

- Propose supportive measures to assist water utilities

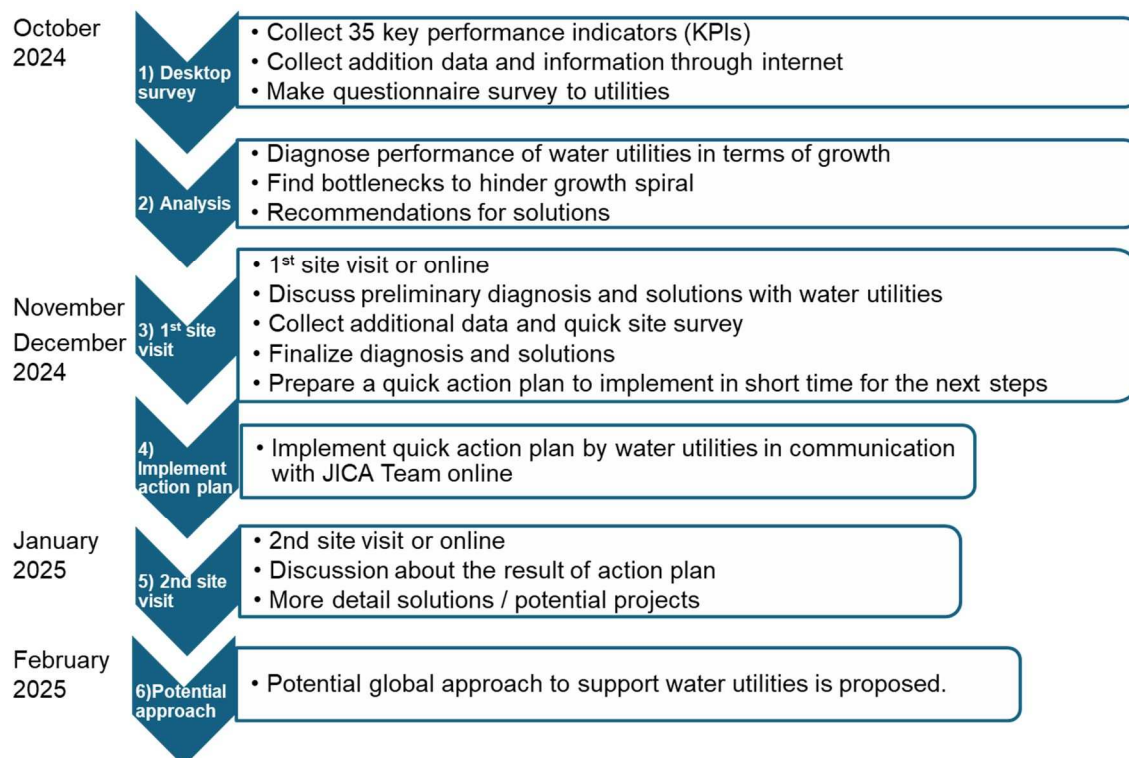


Figure 1-1 Process of the Study

The JICA Study Team initially envisioned the action plan as the implementation of short-term improvement measures to help water utilities move to the next step. The implementation of these short-term measures provided an opportunity to assess the attitude and initiative of the water utility executives. Based on this assessment, the policy was to select the utilities to be targeted in the second on-site survey. Reaching an agreement on an action plan that would lead to actual improvements proved to be difficult, given the consultations with the water supply organizations and the considerations regarding the future input that JICA can envisage (which might raise expectations for the forthcoming technical project). Therefore, the JICA Study Team positioned the action plan as “collection and preparation of materials” to help the water utilities take the first step towards the improvement directions shared and discussed during the on-site survey.

1.3. Implementation Structure and Schedule of This Study

The structure of this study is shown in Figure 1-2 and the study schedule is shown in Figure 1-3.

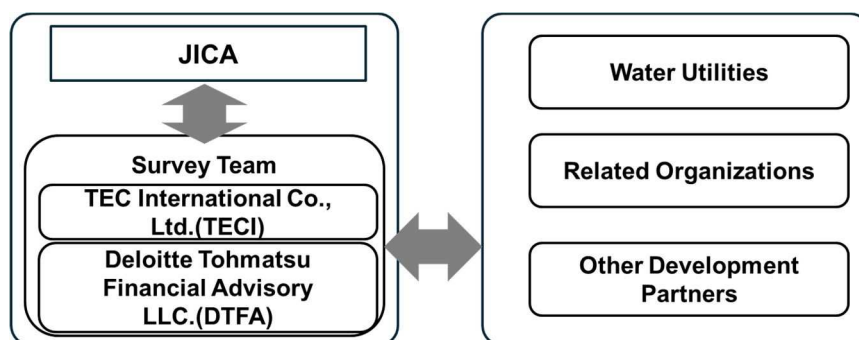


Figure 1-2 Organization of the Study

Year	2024			2025	
Month	10	11	12	1	2
1. Desktop survey					
2. Analysis					
3. 1st site visit					
4. Implement action plan					
5. 2nd site visit					
6. Potential approach					

Figure 1-3 Study Schedule

1.4. Methods of conducting this study (analytical methods)

For this study, an Excel analysis format for diagnosis and solutions was developed to streamline the analysis process for a large number of covered utilities (Categories B and C). One utility (NWSC) with a large amount of published data and materials was used as a model for development. The analysis of each utility was conducted based on this format. The format consists of the following eight sheets. The specific analysis flow is described below. The image of analysis flow is shown in Figure 1-5.

(1) Diagnosis by 35 KPIs (Sheet: 1. Diagnosis by KPIs)

- Collect data on 35 KPIs about the utility through a desktop survey and questionnaire responses
- Collect data on indicators for 4 years whenever possible to identify improvement trends
- Describe for each indicator what can be analyzed from the diagnosis of the indicator only.
- Table1-3 show the 35 Key Performance Indicators set in this study. 21 indicators were set in the JICA Cluster Strategy, and 14 indicators were newly added in this study, making a total of 35 indicators. In addition, the benchmarks of the growth stages were also set based on past experience, etc. (Some of the figures set in JICA's 21 indicators were also revised).

Table1-3 35 Key Performance Indicators (KPIs) established in the Study

Category	Growth spiral element	No .	Key Performance Indicators (KPI)	Growth stage			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (Currency)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ standard compliance rate less than 80%	WQ standard compliance rate (80%-90%)	WQ standard Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Unstable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/ca/day)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales (Currency)				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	NRW ratio (%)	40% or more	25-40%	Less than 25% (15-25%)	Less than 15%

Data Collection Survey on Through Management Improvement Support Based on Cluster Strategy
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Category	Growth spiral element	No .	Key Performance Indicators (KPI)	Growth stage			
				1	2	3	4
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6m³)	—	—	Accrual basis/ Aim for a level of sustainable investment	—
Prerequisites	4. Management and Financial Improvements	19	Accounting system	—	—	Accrue Aiming for public company accounting	—
Profitability		20	Net income (Currency)	—	—	—	—
		21	EBITDA (Currency)	—	—	—	—
		22	EBITDA margin (%)	Negative	0-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	0-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	—
Financial soundness		26	Equity ratio (%)	—	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency /m³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (Currency /m³) (Turnover from sales/ Water sold)	—	—	—	—
		32	Subsidies (Currency)	—	—	—	—
		33	Development Partner grant support (Currency)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
Human resource efficiency		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0

*1: Red items in the column under Key Performance Indicators are indicators newly added by the JICA Study Team.

*2: The red figures in the column under Growth stage are newly added by the JICA Study Team or modified by some of the JICA 21 indicators.

The reasons for adding the 14 new indicators, along with their corresponding calculation formulas, are provided as follows.

Table1-4 Reasons for adding Additional Indicators and Calculation Formulas

No.	KPI	Reason for addition	Formula
1	Investment cost (Currency)	Analyze whether capital investments have been made and compare their trends and scale with EBITDA.	Amount of cash expenditure for the acquisition of tangible fixed assets under investing activities.
3	Production (m ³ /day)	In order to improve service, an increase in water production volume is necessary;	-

Data Collection Survey on Through Management Improvement Support Based on Cluster Strategy
for Supporting the Growth of Water Utilities (Final Report)

No.	KPI	Reason for addition	Formula
		examine the past trend.	
4	Utilization ratio of production capacity (%)	Assess current supply-demand constraints and the potential for future customer growth	Produced Water Volume / Water Treatment Capacity
12	Water sold (m ³ /day)	Note that water tariff revenue will not increase unless the billed water volume rises; monitor the past trend.	-
13	Water consumption per capita per day (L/ca/day)	Confirm the level of water consumption per capita provided by the water supply service.	Daily average water sold / Population served
23	EBITDA margin excl. deferred income (%)	Since the proportion of subsidies within EBITDA can be significant, verify the actual EBITDA derived from water supply operations.	Calculated by subtracting the amortization of subsidies from the EBITDA margin.
28	O&M cost coverage ratio (%)	Check whether operation and maintenance (O&M) costs are covered by business income and if there is sufficient profit available to reinvest in capital expenditures.	Business revenue (Water business revenue + Sewerage business revenue + Subsidies) / O&M Costs (excluding Depreciation and Interest payments)
29	O&M cost coverage ratio excluding subsidies (%)	Because subsidies can make up a large portion of business income, examine the true operational performance.	Business revenue (Water business revenue + Sewerage business revenue) / O&M costs (excluding Depreciation and Interest payments)
30	Unit cost of water supply (Currency /m ³) (Overall cost including DEP/Water sold)	Compare the supply unit price to determine if tariff rates are appropriately set and use this as a benchmark among utilities.	(O&M Costs + Depreciation) / Water sold
31	Supply unit price (Currency /m ³) (Turnover from sales/ Water sold)	Evaluate whether the supply unit price is sufficient for cost recovery, using it as a benchmark among utilities.	Annual turnover from sales/ Water sold
32	Subsidies (Currency)	Assess the dependency on subsidies.	-
33	Development Partner grant support (Currency)	Assess the dependency on subsidies (DP).	
34	The ratio of subsidies and DP support to turnover	Assess the dependency on subsidies.	(Amortization amount of government and DP subsidies recorded in the P/L) divided by turnover from sales.
35	Number of staff per 1,000 connections	Compare with benchmarks for water utilities to evaluate the productivity and efficiency of personnel.	Number of employees per 1,000 connections

(2) Financial Statements Analysis (Sheet: 2. Financial Statements analysis)

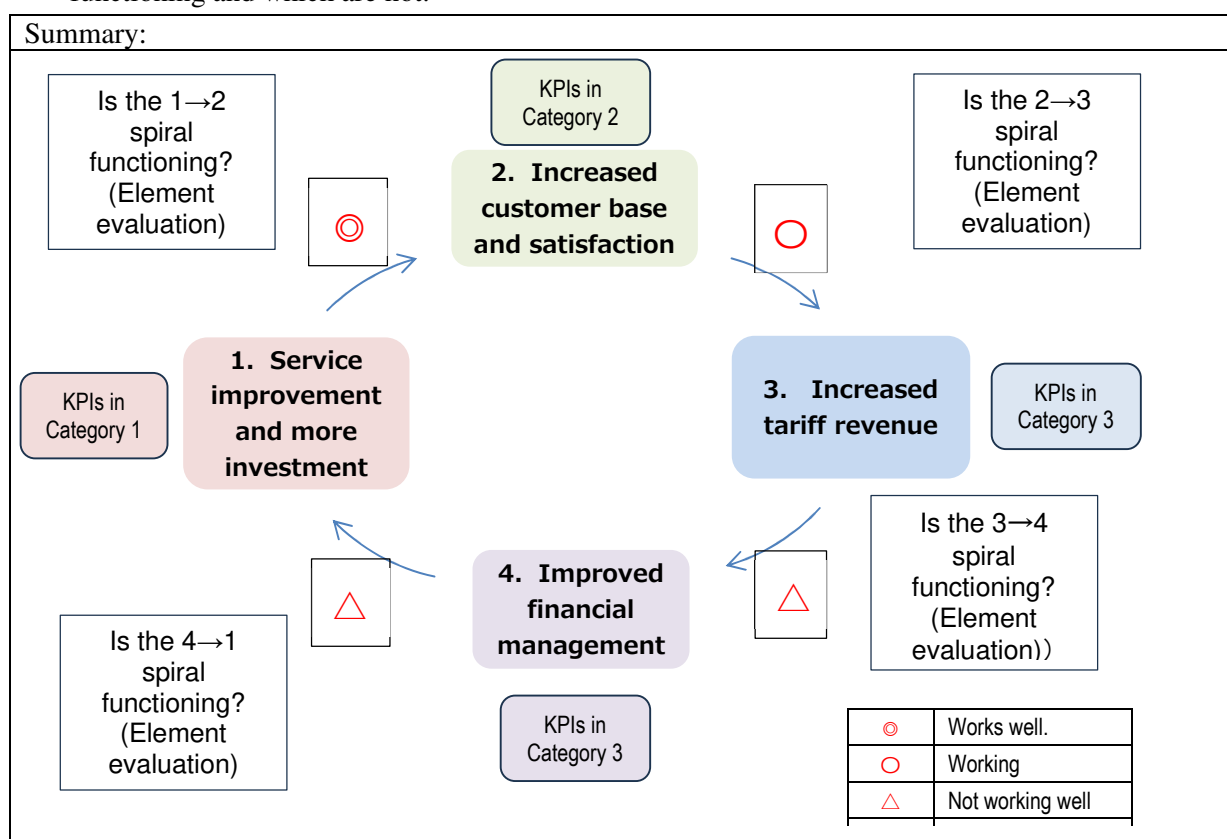
- Perform financial analysis on water utilities for which financial statements are available
- The analysis is summarized including a summary of the financial analysis, and positive and negative aspects.

(3) Growth spiral diagnosis (Sheet: 3. Growth spiral diagnosis)

- Diagnose whether the growth spiral is functioning for each element based on the cluster business strategy's growth spiral.
- Classify 35 indicators into the four elements of the "Growth spiral element" item in Table1-3 and

evaluate whether the spiral is functioning between each element.

- Identify points that require further in-depth (detailed) analysis as inhibiting factors or bottlenecks, based on the evaluation results.
- Summarize the findings from the growth spiral analysis as a comprehensive diagnosis.
- Create an illustrative diagram that explains and depicts which elements of the growth spiral are functioning and which are not.



Note: The detail of element evaluation is shown in Table1-3.

Figure 1-4 Schematic of Growth Spiral Diagnosis

(4) Bottleneck analysis (BA) (Sheet: 4. Bottleneck analysis (BA))

- A format was created, consisting of checklist items that can efficiently and comprehensively identify the growth-bottlenecks of water utility based on desktop surveys and questionnaires. Using these checklist items, the collected data is filled in accordingly to analyze the bottlenecks.

(5) Summary of Bottleneck Analysis (BA) (Sheet: 5. Summary of BA)

- Briefly summarize the results of the bottleneck analysis
- Enter the diagnostic details that could be analyzed from the disincentive analysis results as a disincentive analysis summary.

(6) Strategy analysis (Sheet: 6. Strategy analysis)

- Based on the diagnosis up to sheet 5, describe the strategy to make the growth spiral function after

understanding the vision and mission of the water utility.

- The overall goal is based on the water utility's vision, mission, and plans.
- Mid-term goals should promote the growth of the water utility and enable it to achieve its higher goals.
- Create a diagram of the water utility's current spiral (vicious circle) and the spiral to be improved by this plan (virtuous circle) and describe the activities and growth steps necessary to achieve it.

(7) Potential solutions (sheet: 7. Potential solutions)

- Solutions are developed based on the summary of bottleneck analysis and strategies. The solutions are summarized as activities related to the outcomes and their respective results (Outcomes).
- For each activity, a timeline is shown so that priorities can be understood.
- The solutions are based on the growth steps discussed in sheet 6. Strategy analysis.
- Create a picture of improvement that assumes that the achievement of results will enable the achievement of mid-term and high-level goals.

(8) Overall summary (sheet: Overall summary)

- Since the contents of the analysis up to sheet 7 are extensive, an overall summary sheet was prepared so that the results of the analysis can be grasped on a single sheet.
- The summary sheet was prepared to use it to explain the project to senior management executives, Mayors, and other government administrators.

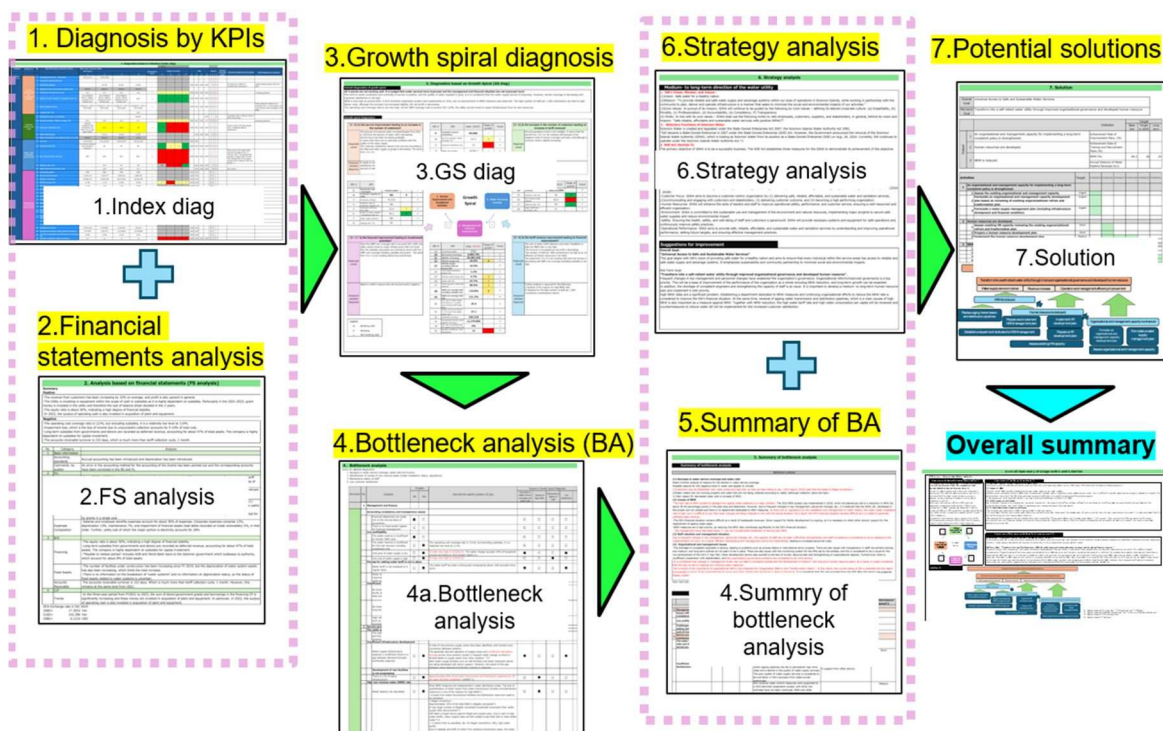


Figure 1-5 Methods of Conducting the Study (Analytical Tool)

Although the analysis of each utility was conducted using the flow described above, the final results of the "growth spiral diagnosis" were updated based on the "Bottleneck Analysis results". Therefore, in the attached diagnostic sheet, Sheet 3. Growth spiral diagnosis was moved and finalized after 5. Summary of BA.

(9) Supplementary Sheets

Based on the KPI analysis, it became clear that NRW is a significant issue for almost all water utilities. Therefore, to demonstrate the financial impact of improving NRW ratios, two sheets are added (excluding JIRAMA).

- PL-NRW1 (Financial Effects of NRW Reduction - Case 1): Of the reduced NRW volume, the portion corresponding to commercial losses leads to increased revenue, while the portion corresponding to physical losses reduces the variable costs of operation and maintenance costs.
- PL-NRW2 (Financial Effects of NRW Reduction - Case 2): The entire volume of reduced NRW leads to increased revenue.

Furthermore, there are two water utility (LWB and BWB) in Malawi, and it was found that BWB's operation and maintenance costs are extremely high. Therefore, a sheet was added to compare the operation maintenance costs of both utilities.

- Comparison with BWB (Financial Comparison between LWB and BWB)

1.5. Selection of utilities to conduct the second field survey

During the first field survey in 2024, the JICA Study Team visited five utilities: SIWA, MCWD, NWSC, LWB, and BWB. Although JIRAMA was also a target utility, due to the upcoming elections in Madagascar, the JICA office in Madagascar decided that the JICA Study Team's visit there was not possible considering the security situation. Therefore, the JICA Study Team conducted online meetings with JIRAMA instead of traveling.

During the first field survey, the JICA Study Team explained the diagnosis and solutions developed based on the desktop survey results to each water utility. At that time, the JICA Study Team also assessed the organization reform initiative and attitude of the water utility executives.

The second field survey included SIWA, MCWD, BWB, and JIRAMA; the reasons for excluding LWB and NWSC from the second field survey were as follows. Instead of the second field survey, the results were explained during the online meeting in February 2025 for LWB and NWSC.

- The growth spirals of NWSC and LWB are functioning well, and it was determined that their priority for support is lower compared to other water utilities.

CHAPTER 2 : DESKTOP SURVEY RESULTS FOR UTILITIES
NOT COVERED BY FIELD SURVEY

2. Desktop Survey Results for Utilities Not Covered by Field Survey

2.1. Category A

2.1.1. Updated indicators and information sources

To update the monitoring sheets for the 14 water utilities classified under Category A, information was collected by referring to publicly available sources such as websites, annual reports, financial statements, and IB-NET data. The collected information regarding the water supply and financial performance indicators of each water utility is summarized in the Table below. For details on the updated monitoring sheet indicators, refer to the Appendix.

Table 2-1 Results of Information Collection on Monitoring Sheets for Category A Water Utilities

No.	Region	Country	City	Water Utility Name	Information Source			
					Website	IBNet	Annual Report	Financial Statements
A1	South Asia	India	Delhi	DJB	×	○	△	△
A2	South Asia	India	Guwahati	GJB	○	×	△	×
A3	South Asia	India	Agra	JKVA	△	×	×	×
A4	South Asia	India	Chennai	CMWSSB	○	○	△	○
A5	South Asia	India	Bengaluru	BWSSB	×	△	△	×
A6	Europe	Turkey	Ankara	ASKİ	○	×	○	×
A7	Middle East	Iraq	Erbil	EWD	×	×	×	×
A8	Middle East	Iraq	Halabja	HWD	×	×	×	×
A9	Middle East	Iraq	Sulaymaniyah	SWD	×	×	×	×
A10	Middle East	Morocco	Fez	RADEEF	○	×	×	×
A11	Middle East	Morocco	Meknes	RADEEM	○	×	○	△
A12	Africa	Cape Verde	Praia	ELECTRA	○	○	○	○
A13	Africa	Senegal	Dakar	SONES	○	×	×	×
A14	Africa	Botswana	Gaborone	WUC	○	○	○	○

Note: "○"= information available, "△"= information only partially available or outdated, "×"= information not available

2.2. Category B

2.2.1. Updated indicators and information sources

To update the monitoring sheets for the 7 water utilities classified under Category B, information was collected by referring to publicly available sources such as websites, annual reports, financial statements, IB-NET data, and the responses from each water utility to the questionnaire. The collected information regarding the water supply and financial performance indicators of each water utility is summarized in the Table below. For details on the updated monitoring sheet indicators, refer to the Appendix.

Table2-2 Results of Information Collection on Monitoring Sheets for Category B Water Utilities

No	Region	Country	City	Water Utility Name	Information Source				Questionnaire
					Webs ite	IB- Net	Annual Report	Financial Statements	
B15	Pacific States	Samoa	Apia	SWA	○	○	○	○	○
B16	South Asia	Bangladesh	Dhaka	DWASA	○	○	○	○	○
B17	South Asia	Bangladesh	Rajshahi	RWASA	○	○	△	○	○
B18 *	South Asia	Bangladesh	Khulna	KWASA	○	○	△	○	○
B19	South Asia	Pakistan	Lahore	WASA-L	○	○	○	○	○
B20	Africa	Tanzania	Dar es Salaam	DAWASA	○	○	○	○	×
B21	Africa	Zambia	Lusaka	LWSC	○	○	○	×	○

* KWASA has not been analyzed due to late responses to the questionnaire. KWASA shall be treated as Category A, not Category B. Therefore, only a monitoring sheet has been prepared for the analysis of KWASA.

Note: "○" indicates information is available, "△" indicates information is only partially available or outdated, and "×" indicates information is not available.

2.2.2. Results of diagnostic

The results of the indicator-based diagnosis, financial statement analysis, and comprehensive diagnosis of the growth spiral for each of the water utilities classified in Category B are summarized below.

2.2.2.1. SWA

(1) Index-based diagnosis (Index diag)

Table2-3 Key Performance Indicators of SWA

KPI #	KPI	Data (2022/23)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (WST)	6,260,474	-	↘
2	Production capacity (m³/day)	NA	-	-
3	Production (m³/day)	74,278	-	-
4	Utilization ratio of production capacity (%)	NA	-	-
5	Continuity of Service (Hrs/day)	24	3	→
6	Quality of water supplied (Compliance rate: %)	100	4	→
7	Water supply pressure	enough	3	→
8	Leakage ratio (breaks/year)	1,169	-	↘
	2.Increased customer base and satisfaction			
9	Population served	190,195	-	-
10	Service coverage / Water coverage (%)	90	3	→
11	Customer satisfaction (%)	-	NA	-
12	Water sold (m ³ /day)	38,473	-	-
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	202	-	-
	3.Increased tariff revenue			
14	Turnover from sales (WST)	29,297,861	-	→
15	Collection ratio (%)	79	2	↗
16	NRW ratio (%)	41	1	↗
17	Metering ratio (%)	99	4	↗
18	Water tariff level (USD/6m ³)	19.66	-	-
	4.Improved financial management			
19	Accounting system	corporate accounting	-	-
20	Net income (WST)	-1,133,435	-	→
21	EBITDA (WST)	4,819,980	-	↘
22	EBITDA margin (%)	23	2	→
23	EBITDA margin excl. deferred income (%)	-10	1	↘
24	Total capital operating margin (%)	-0	-	→
25	Operating Profit Margin (%)	-4	1	↘
26	Equity ratio (%)	31	2	↘
27	Fixed long term conformity rate (%)	85	3	↘
28	O&M cost coverage ratio (%)	115	2	↘
29	O&M cost coverage ratio excluding subsidies (%)	87	1	↘
30	Unit cost of water supply (WST /m ³) (Overall cost including DEP/Water sold)	NA	-	-
31	Supply price (WST /m ³) (Turnover from sales/ Water sold)	NA	-	-
32	Subsidies (WST)	6,920,474	-	↗
33	Development Partner grant support (WST)	0	-	-
34	The ratio of subsidies and DP support to turnover	33	-	↗
35	Number of staff per 1,000 connections	9	2	→
	GDP per capita (USD)	4,330.2		

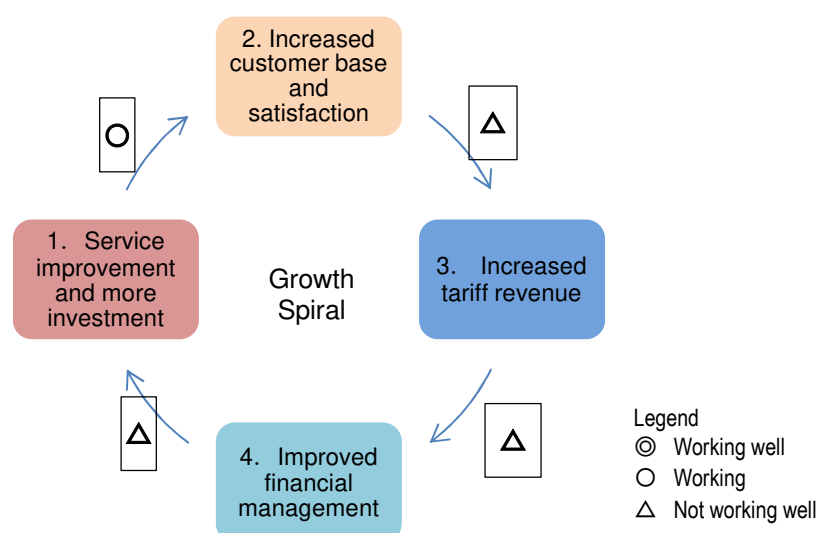
Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial Statement Analysis

Table2-4 SWA's Financial statement analysis results

Summary
The most available data is for the financial year ending June 2022. Thus, the financial situation might have changed. SWA has a slight plus/minus net income during the four years from 2018/2019. The grants account for 17% of the total income and the amount is more or less stable for four years. The utility received a significant portion of the government grants for capital investment. Further, Operation and maintenance (O&M) cost is not fully covered by the tariff revenue. SWA invests in fixed assets more than annual depreciation, which is positive in terms of expanding the infrastructure, although these investment activities are supported by the government grant.
Positive
SWA had a positive net income until 2021. SWA invests in fixed assets more than its annual depreciation.
Negative
The net income decreased and became negative in 2022. This is because of a 10% decrease in turnover in 2022. Further O&M cost coverage is not beyond 100% excluding the subsidy. This means O&M cost is not fully covered by the tariff revenue. Further, Personal costs account for 40% of operation costs, which is relatively high.

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
SWA provides a good level of water supply services, including continuity, quality, pressure, and service coverage. The spiral 1 to 2 is working, though customer satisfaction needs to be verified. However, the NRW ratio is high and increasing, while the collection ratio remains relatively low—both key factors contributing to insufficient revenue turnover. Additionally, the tariff level should be assessed. The spiral 2 to 3 is not working well, and the overall financial condition is weak, indicating that the spiral 3 to 4 is also not working well. O&M cost coverage is less than 100% excluding the subsidy. Although the infrastructure investments are being made, SWA remains heavily dependent on government grants, highlighting a lack of financial self-sufficiency. To place SWA on a sustainable growth spiral, improvements in the NRW ratio and collection efficiency, along with an appropriate tariff level (subject to further evaluation), are essential. Furthermore, the uncertainty surrounding production capacity could impact on future service reliability.

Figure 2-1 Comprehensive diagnostic results of SWA's growth spiral

2.2.2.2. DWASA

(1) Index-based diagnosis (Index diag)

Table2-5 Key Performance Indicators of DWASA

KPI #	KPI	Data (FY2022/2023)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (BDT)	29,878,023	-	↘
2	Production capacity (m³/day)	2,750,000	-	-
3	Production (m ³ /day)	2,680,000	-	→
4	Utilization ratio of production capacity (%)	97	-	-
5	Continuity of Service (Hrs/day)	24	3	→
6	Quality of water supplied (Compliance rate: %)	91.48	4	→
7	Water supply pressure	1bar	-	→
8	Leakage ratio (breaks/year)	320	-	→
	2.Increased customer base and satisfaction			
9	Population served	22,000,000	-	-
10	Service coverage / Water coverage (%)	100	4	→
11	Customer satisfaction (%)	high	3	→
12	Water sold (m ³ /day)	2,139,643	-	-
13	Water consumption per capita per day (L/ca/day)	97	-	-
	3.Increased tariff revenue			
14	Turnover from sales (BDT)	25,562,125	-	↗
15	Collection ratio (%)	100	4	→
16	NRW ratio (%)	18	3	→
17	Metering ratio (%)	98	3	→
18	Water tariff level (USD/6m ³)	0.77	3	→
	4.Improved financial management			
19	Accounting system	International Financial Reporting Standards (IFRS)	-	-
20	Net income (BDT)	-5,258,669	-	↘
21	EBITDA (BDT)	9,606,030	-	→
22	EBITDA margin (%)	50	3	↘
23	EBITDA margin excl. deferred income (%)	30	2	↘
24	Total capital operating margin (%)	2	-	→
25	Operating Profit Margin (%)	-16	1	↘
26	Equity ratio (%)	28	2	-
27	Fixed long term conformity rate (%)	94	3	→
28	O&M cost coverage ratio (%)	212	3	→
29	O&M cost coverage ratio excluding subsidies (%)	177	3	↘
30	Unit cost of water supply (BDT / m ³) (Overall cost including DEP/Water sold)	18	-	-
31	Supply price (BDT / m ³) (Turnover from sales/ Water sold)	33	-	-
32	Subsidies (BDT)	3,847,291	-	-
33	Development Partner grant support (BDT)	0	-	-
34	The ratio of subsidies and DP support to turnover	20	-	-
35	Number of staff per 1,000 connections	14	1	→
	GDP per capita (USD)	2,551.0		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

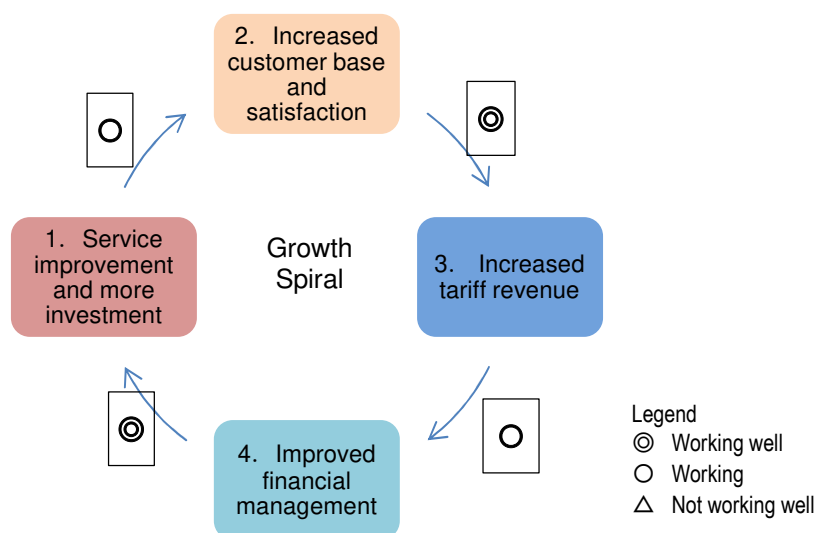
(2) Financial Statement Analysis

Table2-6 DWASA Financial statement analysis results

Summary
DWASA's financial performance is very high with its O&M cost coverage ratio excluding subsidies in 2022-2023 at 177%. DWASA makes capital expenditure more than its depreciation expenditure. This investment is mainly financed through borrowing loans from development partners for the investment. However, the exchange losses, recorded as non-operating expenses, caused deficits for the last 2 years.

Positive
DWASA's O&M cost coverage ratio excluding subsidies in 2022-2023 is 177% (199% in 2021-2022, respectively) and they borrow loans from development partners for infrastructure investment.
Negative.
DWASA marked a significant exchange loss, which caused a negative net profit in 2022-23. This further made DWASA have accumulated losses in their B/S. DWASA receives grants. A certain level of grant funding is reasonable, as DWASA operates sewerage services, which are not financially lucrative.

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
DWASA serves a large population of 22 million in Dhaka with high service continuity, water quality, pressure, and coverage. The utilization ratio of production capacity is nearly 100%, indicating no spare production capacity. The NRW ratio is as low as 18%, contributing to good revenue. The water tariff has been adjusted for inflation, leading to positive turnover trends. Financially, DWASA shows high operating efficiency with a 30% EBITDA margin and 177% O&M cost coverage ratio in 2022-2023. Despite accumulated losses due to inflation, financial performance remains robust, supported by loans from development partners for infrastructure investment. However, the number of staff per 1,000 connections remains high, suggesting room for improvement in staff efficiency. Improving this aspect could further enhance operational effectiveness and financial stability.

Figure 2-2 Comprehensive diagnostic results of DWASA's growth spiral

2.2.2.3. RWASA

(1) Index-based diagnosis (Index diag)

Table2-7 Key Performance Indicators of RWASA

KPI #	KPI	Data (2022)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (BDT)	-	-	-
2	Production capacity (m³/day)	107,040	-	-
3	Production (m³/day)	107040	-	↗
4	Utilization ratio of production capacity (%)	1	-	-
5	Continuity of Service (Hrs/day)	12	2	→
6	Quality of water supplied (Compliance rate: %)	81	3	→
7	Water supply pressure	2bar	-	-
8	Leakage ratio (%)	-	-	-
	2.Increased customer base and satisfaction			
9	Population served	564,000	-	-
10	Service coverage / Water coverage (%)	88	3	↗
11	Customer satisfaction (%)	-	NA	-
12	Water sold (m ³ /day)	75,490	-	-
13	Water consumption per capita per day (L/ca/day)	134	-	-
	3.Increased tariff revenue			
14	Turnover from sales (BDT)	-	-	-
15	Collection ratio (%)	67	2	↗
16	NRW ratio (%)	29	2	→
17	Metering ratio (%)	0	NA	-
18	Water tariff level (USD/6m ³)	0	-	-
	4.Improved financial management			
19	Accounting system	IFRS	-	-
20	Net income (BDT)	350,623,619	-	↗
21	EBITDA (BDT)	391,543,873	-	↗
22	EBITDA margin (%)	608	3	↗
23	EBITDA margin excl. deferred income (%)	-295	1	↘
24	Total capital operating margin (%)	20	-	↗
25	Operating Profit Margin (%)	52	3	↗
26	Equity ratio (%)	98	3	→
27	Fixed long term conformity rate (%)	60	3	↗
28	O&M cost coverage ratio (%)	232	3	↗
29	O&M cost coverage ratio excluding subsidies (%)	23	1	↗
30	Unit cost of water supply (BDT/m ³) (Overall cost including DEP/Water sold)	NA	-	-
31	Supply price (BDT/m ³) (Turnover from sales/ Water sold)	NA	-	-
32	Subsidies (BDT)	581,519,459	-	↗
33	Development Partner grant support (BDT)	0	-	-
34	The ratio of subsidies and DP support to turnover	903	-	↗
35	Number of staff per 1,000 connections	6	3	↗
	GDP per capita (USD)	2,551.0		

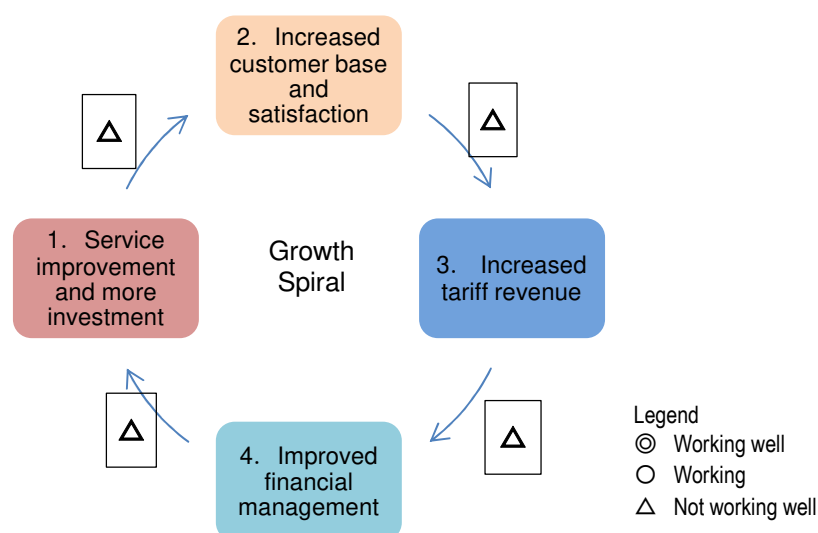
Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial Statement Analysis

Table2-8 RWASA financial statement analysis results

Summary
As the latest financial information is for the financial year ending June 2022, it should be noted that the financial situation might have changed. RWASA actively invests in infrastructure expansion by utilizing the government subsidy. However, RWASA is highly dependent on the Donation Received from the Government and therefore, the O&M cost coverage ratio excluding subsidies is only 20%, which indicates the O&M cost is not covered by tariff revenue.
Positive
RWASA invests in the acquisition of fixed asset 10 times more than annual depreciation. This is supported by the Government donation.
Negative
RWASA is highly dependent on the Donation Received from the Government, which accounts for 87% of the total annual income. Therefore, the O&M cost coverage ratio excluding subsidies is only 20%, which implies that the O&M cost is not covered by tariff revenue.

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
RWASA faces several critical challenges. The high water pressure in the distribution system causes frequent pipe leaks and breaks, leading to frequent customer complaints. Despite its increased service coverage, the utility's growth is ineffective. The collection ratio is improving but remains low. The lack of a metering system hinders accurate NRW management and proper billing. Its O&M cost coverage ratio excluding subsidies is only 20%, resulting in a poor financial situation. Therefore, RWASA heavily relies on government subsidies. Infrastructure investments depend on these subsidies, indicating a lack of financial self-sustainability. The utility invests in infrastructure at a rate 10 times higher than annual depreciation, funded entirely by government donations. Significant improvements in financial management, metering, and infrastructure maintenance are needed for sustainability.

Figure 2-3 Comprehensive diagnostic results of RWASA's growth spiral

2.2.2.4. KWASA

In case of KWASA, it was not possible to conduct the analysis due to its late responses to the questionnaire. Only the monitoring sheet was updated (see Appendix).

2.2.2.5. WASA-L

(1) Index-based diagnosis (Index diag)

Table2-9 WASA-L Key Performance Indicators of WASA-L

KPI #	KPI	Data (2023)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (PKR)	-	-	-
2	Production capacity (m³/day)	1,636,592	-	-
3	Production (m³/day)	1,459,294	-	-
4	Utilization ratio of production capacity (%)	89.17	-	-
5	Continuity of Service (Hrs/day)	11	1	→
6	Quality of water supplied (Compliance rate: %)	98	4	→
7	Water supply pressure	1~3m	1	→
8	Leakage ratio (breaks/year)	26,510	-	↘
	2.Increased customer base and satisfaction			
9	Population served	8,700,000	-	-
10	Service coverage / Water coverage (%)	100	4	→
11	Customer satisfaction (%)	-	NA	-
12	Water sold (m ³ /day)	-	-	-
13	Water consumption per capita per day (L/ca/day)	168	0	-
	3.Increased tariff revenue			
14	Turnover from sales (PKR)	10,950,706,147	-	-
15	Collection ratio (%)	91	3	↗
16	NRW ratio (%)	17	3	↗
17	Metering ratio (%)	1	1	↘
18	Water tariff level (USD/6m ³)	Depends on the size of the house.	-	-
	4.Improved financial management			
19	Accounting system	IFRS	-	-
20	Net income (PKR)	14,139,000	-	↗
21	EBITDA (PKR)	24,783,325	-	↗
22	EBITDA margin (%)	0.22	2	↗
23	EBITDA margin excl. deferred income (%)	-55	1	↗
24	Total capital operating margin (%)	0	-	↗
25	Operating Profit Margin (%)	0	2	↗
26	Equity ratio (%)	-22	2	↗
27	Fixed long term conformity rate (%)	106	2	→
28	O&M cost coverage ratio (%)	73	1	↗
29	O&M cost coverage ratio excluding subsidies (%)	64	1	↗
30	Unit cost of water supply (PKR /m ³) (Overall cost including DEP/Water sold)	NA	-	-
31	Supply price (PKR /m ³) (Turnover from sales/ Water sold)	NA	-	-
32	Subsidies (PKR)	6,236,143,415	-	↗
33	Development Partner grant support (PKR)	19,017,288	-	Up down
34	The ratio of subsidies and DP support to turnover	56	-	↘
35	Number of staff per 1,000 connections	4	3	→
	GDP per capita (USD)	1,365.3		

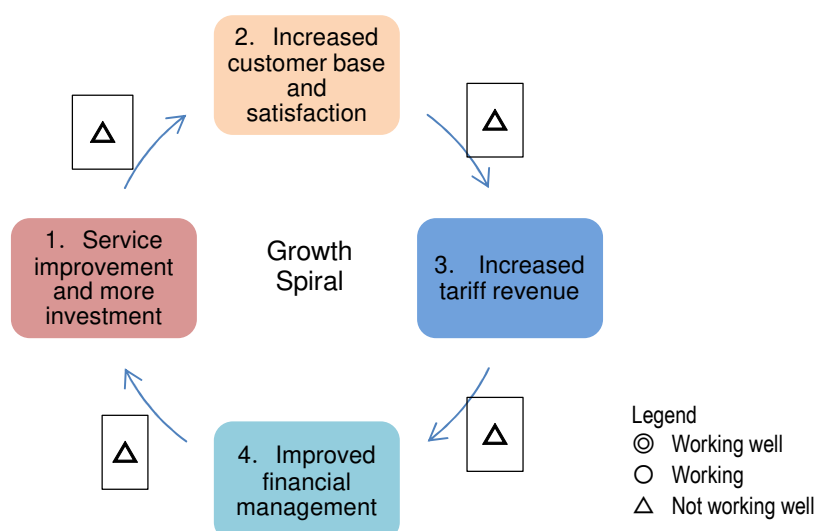
Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial Statement Analysis

Table2-10 WASA-L Financial statement analysis results

Summary
WASA-L operates water and sewerage services. The proportion of revenue contributed by water is 32% and by sewerage is 20% respectively. The rest is mainly accounted for by amortization of deferred income. The profitability is low as indicated by a negative EBITDA margin excluding deferred income. This led to the accumulated losses, although depreciation (revaluation surplus/deficit as well) is not recorded in the P/L. While the O&M coverage ratio excluding subsidy has improved over the last 4 years, it is still 75%. The WASA-L has been supported by subsidies.
Positive
The O&M coverage ratio excluding subsidy has improved over the last 4 years. The account receivables are only 16% of annual water and sewerage sales, meaning that the tariff is collected in around 60 days. However, this figure is improving.
Negative
Profitability is low at -55.4% of EBITDA margin(excluding deferred income) in 2023. Operating profit margin used to be negative until 2022 but it became slightly positive at 0.1% in 2022. This has contributed to the accumulated loss. However, it should be noted that WASA-L is operating sewerage and drainage service of which profitability is lower. Further, deferred credit (mainly government subsidy) accounts for 87% of the balance sheet and increases by 8% annually

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
The growth spiral from 1 to 2 is not working as water supply hours are short and intermittent, which may not satisfy the customers, although the supply coverage is 100% and water quality is good. The functional metering ratio is very low at 1%, leading to flat-rate tariffs based on house size. The growth spiral from 2 to 3 is not working as a further increase of turnover is not expected without metered tariff and estimation of NRW with metered consumption. While the NRW ratio is low, the increased number of leaks indicates increase in NRW in the future. While the O&M coverage ratio excluding subsidy has improved over the last 4 years, it is still 75%. Thus the WASA-L has been supported by subsidies. It should be noted that WASA-L does not record depreciation as expenses. Investments are financed by using government subsidies. The spirals from 3 to 4 and 4 to 1 is not working. Therefore, the overall growth spiral is not working. Based on the analysis, introducing water meters and improving NRW management would be essential for achieving sustainability and financial stability along with additional water resource development.

Figure 2-4 Comprehensive diagnostic results of WASA-L growth spiral

2.2.2.6. DAWASA

(1) Index-based diagnosis (Index diag)

Table2-11 Key Performance Indicators of DAWASA

KPI #	KPI	Data (2022)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (TZS)	162,565,879	-	↗
2	Production capacity (m³/day)	524,137	-	↗
3	Production (m³/day)	354,110	-	↘
4	Utilization ratio of production capacity (%)	68	-	↘
5	Continuity of Service (Hrs/day)	19	2	↘
6	Quality of water supplied (Compliance rate: %)	88	3	↘
7	Water supply pressure	0	-	-
8	Leakage ratio (%)	0	-	-
	2.Increased customer base and satisfaction			
9	Population served	4,998,135	-	↘
10	Service coverage / Water coverage (%)	75	2	↘
11	Customer satisfaction (%)	0	NA	-
12	Water sold (m ³ /day)	-	-	-
13	Water consumption per capita per day (L/ca/day)	NA	-	-
	3.Increased tariff revenue			
14	Turnover from sales (TZS)	135,283,233	-	→
15	Collection ratio (%)	95.1	3	→
16	NRW ratio (%)	41.49	1	↗
17	Metering ratio (%)	100	4	→
18	Water tariff level (USD/6m ³)	4.05	-	→
	4.Improved financial management			
19	Accounting system	accrual basis of	3	-
20	Net income (TZS)	108,862,775	-	↗
21	EBITDA (TZS)	134,780,433	-	↗
22	EBITDA margin (%)	45	3	↗
23	EBITDA margin excl. deferred income (%)	-9	1	↘
24	Total capital operating margin (%)	11	-	↗
25	Operating Profit Margin (%)	37	3	↗
26	Equity ratio (%)	70	3	↘
27	Fixed long term conformity rate (%)	113	2	↗
28	O&M cost coverage ratio (%)	183	3	↗
29	O&M cost coverage ratio excluding subsidies (%)	91	1	↘
30	Unit cost of water supply (TZS /m ³) (Overall cost including DEP/Water sold)	NA	-	-
31	Supply price (TZS /m ³) (Turnover from sales/ Water sold)	NA	-	-
32	Subsidies (TZS)	10,505,369	-	↗
33	Development Partner grant support (TZS)	137,446,964	-	↗
34	The ratio of subsidies and DP support to turnover	50	-	↗
35	Number of staff per 1,000 connections	4.0	3	→
	GDP per capita (USD)	1,224.5		

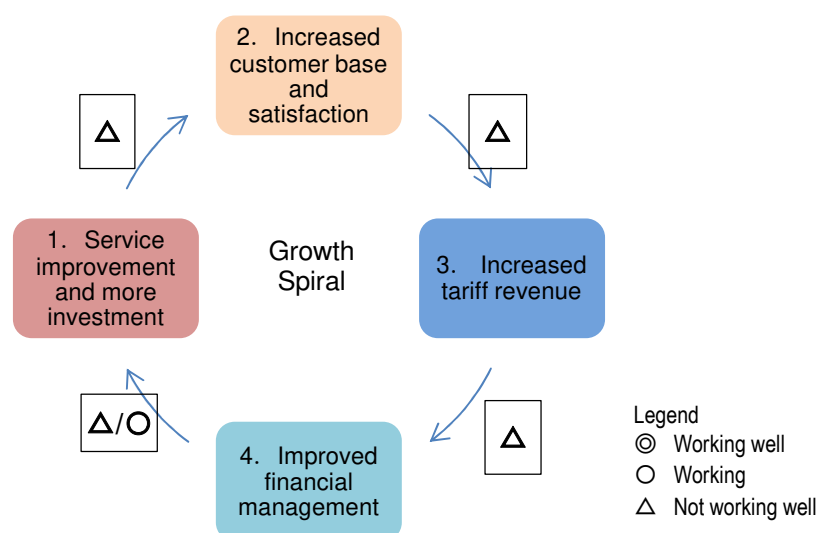
Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial Statement Analysis

Table2-12 DAWASA's Financial Statement Analysis Results

Summary
- While the revenue from the water and sewerage charges has stagnated from FY2021/2022 to FY2022/2023 with almost 0% growth, the total expenses increased by 12%. Thus, the O&M cost coverage ratio excluding subsidies and depreciation declined to 91% from 101%. However, DAWASA's profitability was supported by increased "Amortization of government grants" and "Revenue grant". These two types of grants account for 50% of the total revenue. - It should be noted that DAWASA's sewer connections are over 17,000 in FY2022/2023. In FY2022/2023, DAWASA acquired land and completed design for the construction of wastewater treatment facilities. Thus, the wastewater service will increase in the future. The proportion of the Population connected to sewerage networks is 12.35%
Positive
The "Property, plant and equipment (PPE)" increased by 28%, partly due to the completion of capital work. This enhanced PPE is expected to result in an increase in revenue in the coming years.
Negative
The trade and other receivables increased by 87%, which accounts for 79% of the water and sewerage charges. This impacts the cashflow negatively.

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
'DAWASA's service has not improved, indicated by the lack of the production volume increase. Thus, both the service coverage and served population declined. While the turnover from water and sewerage charges remains at the same level, the expenses have increased. Thus, the increase in net income was only due to the increase of grants. This is shown by the EBITDA margin excluding deferred income's decline. Thus, almost all investments are financed by development partners' grant. The PPE was increased by 28% in FY2022/2023, partly due to completion of capital work. This enhanced PPE is expected to result in a revenue increase in the coming years. Overall, the growth spiral is not working well.

Figure 2-5 Comprehensive Diagnostic Results of DAWASA's Growth Spiral

2.2.2.7. LWSC

(1) Index-based diagnosis (Index diag)

Table2-13 Key Performance Indicators of LWSC

KPI #	KPI	Data (2023)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (ZMW)	-	-	-
2	Production capacity (m³/day)	344,529	-	-
3	Production (m³/day)	279,060	-	↘
4	Utilization ratio of production capacity (%)	81	-	-
5	Continuity of Service (Hrs/day)	17	2	→
6	Quality of water supplied (Compliance rate: %)	82	3	↗
7	Water supply pressure	-	-	-
8	Leakage ratio (breaks/year)	683	-	↗
	2.Increased customer base and satisfaction			
9	Population served	2,871,574	-	↗
10	Service coverage / Water coverage (%)	94.8	3	→
11	Customer satisfaction (%)	53	1	-
12	Water sold (m ³ /day)	128,365	-	↘
13	Water consumption per capita per day (L/ca/day)	45	-	→
	3.Increased tariff revenue			
14	Turnover from sales (ZMW)	361,684,336	-	↗
15	Collection ratio (%)	74	2	↘
16	NRW ratio (%)	57	1	↘
17	Metering ratio (%)	68	1	→
18	Water tariff level (USD/6m ³)	1.28	-	→
	4.Improved financial management			
19	Accounting system	IFRS	-	-
20	Net income (ZMW)	-51,620,702	-	↘
21	EBITDA (ZMW)	-	-	-
22	EBITDA margin (%)	-	NA	-
23	EBITDA margin excl. deferred income (%)	-	NA	-
24	Total capital operating margin (%)	-1.8	-	↘
25	Operating Profit Margin (%)	-10	1	↘
26	Equity ratio (%)	18	2	→
27	Fixed long term conformity rate (%)	1.3	3	→
28	O&M cost coverage ratio (%)	71	1	↘
29	O&M cost coverage ratio excluding subsidies (%)	-	NA	-
30	Unit cost of water supply (ZMW /m ³) (Overall cost including DEP/Water sold)	11,265	-	↘
31	Supply price (ZMW /m ³) (Turnover from sales/ Water sold)	7,720	-	↗
32	Subsidies (ZMW)	0	-	-
33	Development Partner grant support (ZMW)	0	-	-
34	The ratio of subsidies and DP support to turnover	0	-	-
35	Number of staff per 1,000 connections	5	3	→
	GDP per capita (USD)	1,330.7		

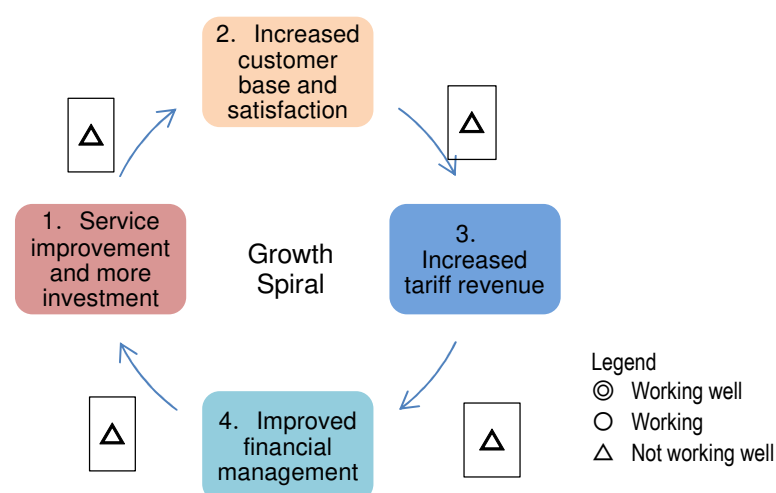
Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial Statement Analysis

Table2-14 LWSC Financial Statement Analysis Results

Summary
This financial analysis is mainly based on the LWSC's responses to the questionnaire, water sector report 2023, and strategic plan because of the non-availability of financial statements. Thus, it is very limited. Profitability has declined in the recent two years. According to the sector report, the O&M coverage ratio was 107% in FY2022 and declined to 71% in FY2023. This deficit is covered by delayed payment for Energy costs particularly electricity.
Positive
The equity ratio used to be negative, but became positive after 2022, although the reason is not identified.
Negative
Profitability has declined in the recent two years. According to the sector report, the O&M coverage ratio was 107% in FY2022 and declined to 71% in FY2023. The full cost recovery ratio (including depreciation, finance cost and allowable provisions), was 88% in FY2022 and reduced to 61% in FY2023. This is due to the overall cost increased by 23% from 2022 to 2023 whereas revenue only increased by 3%, which caused the negative profit in 2023. The account receivable amounts to 75% of the revenue from water and sanitation. This is a matter of concern.

(3) Comprehensive diagnosis of growth spiral



Overall diagnosis of growth spiral
'While LWSC has a high service coverage of 94.8%, its customer satisfaction is not high due to limited-service hours and insufficient water supply. Despite improvements in water quality, it remains suboptimal. The utility faces high demand that outstrips supply, necessitating new water resources to expand capacity and improve service continuity. LWSC has struggled with low metering rates, high NRW, and unadjusted tariffs since 2019, leading to negative profitability. Consequently, profitability has declined in the recent two years. According to the sector report, the O&M coverage ratio declined from 107% in FY2022 to 71% in FY2023. The full cost recovery ratio (including depreciation, finance cost and allowable provisions), was 88% in FY2022 and 61% in FY2023. In order to finance investments, LWSC relies on government grants and concessional loans. Staff shortages exacerbate operational challenges although the staff number per 1,000 connections falls in an appropriate range. Given the inflation rate of 13% as of December 2023, the lack of tariff adjustments has further decreased profitability. The growth spiral is not working well, highlighting the need for strategic improvements in metering, NRW management, tariff adjustment and financial planning to achieve a functional growth spiral. It should be noted that the strategic plan (2022-2027) and the answers to the questionnaire by the JICA Study Team state that the development of wastewater plants and sewerage network is a priority.

Figure 2-6 Comprehensive Diagnostic Results of LWSC's Growth Spiral

CHAPTER 3 : RESULTS OF FIELD SURVEY TARGET UTILITIES

3. Results of Field Survey Target Utilities

3.1. Metro Cebu Water District (MCWD)

3.1.1. Results of utility analysis

3.1.1.1. Results of analysis after desktop survey and field study

(1) Updated indicators

Table3-1 Key Performance Indicators (MCWD)

KPI #	KPI	FY2023	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (PHP)	238,147,604		→
2	Production capacity (m³/day)	276,058		↗
3	Production (m³/day)	275,993		↗
4	Utilization ratio of production capacity (%)	100.0		-
5	Continuity of Service (Hrs/day)	21.91	2	→
6	Quality of water supplied (Compliance rate: %)	100.0	4	-
7	Water supply pressure	74.7% (24/7)		-
8	Leakage ratio (%)	32.30		↘
	2.Increased customer base and satisfaction			
9	Population served	205,882		↗
10	Service coverage / Water coverage (%)	32	1	→
11	Customer satisfaction (%)			-
12	Water sold (m ³ /day)	183,271		↗
13	Water consumption per capita per day (L/ca/day)	209.0		-
	3.Increased tariff revenue			
14	Turnover from sales (PHP)	2,055,967,702		↗
15	Collection ratio (%)	81.2	2	→
16	NRW ratio (%)	92.4		↗
17	Metering ratio (%)	33.38	2	↘
18	Water tariff level (USD/6m ³)	100	4	→
	4.Improved financial management			-
19	Accounting system	PERS		
20	Net income (PHP)	48,521,215		↗
21	EBITDA (PHP)	247,786,435		→
22	EBITDA margin (%)	11.96	2	→
23	EBITDA margin excl. deferred income (%)	11.72	2	→
24	Total capital operating margin (%)	0.86	-	→
25	Operating Profit Margin (%)	2.86	2	→
26	Equity ratio (%)	71.92	3	→
27	Fixed long term conformity rate (%)	67.17	3	→
28	O&M cost coverage ratio (%)	114.24	2	→
29	O&M cost coverage ratio excluding subsidies (%)	113.39	2	→
30	Unit cost of water supply (PHP /m ³) (Overall cost including DEP/Water sold)	29.9		
31	Supply price (PHP /m ³) (Turnover from sales/ Water sold)	30.7		
32	Subsidies (PHP)	5,642,701		↘
33	Development Partner grant support (PHP)	No information		-
34	The ratio of subsidies and DP support to turnover	0.00		→
35	Number of staff per 1,000 connections	4.18		→
	GDP per capita (USD)	3,804.9		
	Inflation rate (%)	5.98		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis

1) Summary

- MCWD's O&M coverage ratio (%) is 113%. MCWD is self-sufficient and does not receive either subsidies or transfers from the government to supplement revenues. MCWD generates at least a profit on a full-cost recovery basis, which has been accumulated as retained earnings.
- MCWD is unable to secure loans for major investments, such as expanding the water supply system, developing water sources, or replacing aging pipelines, due to its insufficient O&M cost coverage ratio. As a result, MCWD primarily utilizes its own funds for small-scale and short-term investments. MCWD also invests short-term cash equivalent in institutions such as the Development Bank of the Philippines, which is a temporary, short-term measure rather than a regular practice.

2) Positive

- MCWD generates at least a profit on a full-cost recovery basis.
- The net debt ratio is only 5%. The company has accumulated considerable retained earnings, which account for approximately 60% of B/S. This means MCWD has sufficient financial stability.

3) Negative

- EBITDA margin is just over 12% and return on assets (RoA) is around 0.3%, with room for improvement.
- MCWD did not invest/leverage its own funds in facility expansion.
- Infrastructure Assets is already 65% depreciated, suggesting the infrastructure is old.
- MCWD has recorded zero financial cash inflow for the past three years, investment cash outflow has been just equivalent to depreciation.

(3) Summary of bottleneck analysis

(Internal factors)

a) Increasing costly water resources and less potential for development of water resources

Water resources are scarce due to the limited number of water resources, competition for water resources, and illegal deep wells. The groundwater has no potential due to increasing salinity and nitrate pollution. The MCWD's 10-year plan envisages the costly development of surface water (river), which is located far from the Cebu Metropolitan area, along with the use of high-price seawater desalination.

b) Degradation in groundwater and increasing connection request

Water resource management is limited. Over-reliance on groundwater in Metro Cebu leads to depletion and saltwater intrusion; degraded watersheds like Buhisan and Mananga reduce recharge capacity. While no official coverage data is available, it is estimated that only 3% of the population relies on piped water, while 65% use private wells as their primary water source. Groundwater quality deterioration is leading some users to seek MCWD connections.

c) Infrastructure limitations

Aging pipelines in Metro Cebu cause frequent leaks; inadequate storage, treatment, and septage facilities hinder service reliability and sanitation efforts.

d) Increasing NRW

The lowest NRW was 19% but has been increasing and reached to 34.68% (first quarter of 2024), which acts as a bottleneck to increasing water supply and improving financial conditions. Non-physical losses including pilferages/illegal connection, fire trucks managed by Local Government Units (LGUs), etc. are other factors that increase NRW in addition to leakage from aged network with high pressure.

e) Training needs

There are training needs (Request from MCWD to JICA Philippine office in Dec 2024). The training center is under construction, but the training program has not been prepared in advance. Regarding NRW management, the NRW repair team is small (6-7 staff) and MCWD needs NRW management training: NRW leak detection training, NRW reduction program, and NRW reduction program.

(External factors)

f) Limited funding

Investment activities, such as water source development, network expansion, and replacement, face funding challenges. Despite having retained earnings on its balance sheet although it is limited, MCWD does not seek borrowings. The limited borrowing capacity and restricted financial options, primarily due to delays in decisions regarding the approval of water tariff adjustments, represent a significant bottleneck.

g) Regulatory fragmentation

Regulatory fragmentation is a major issue due to the lack of a unified water governance body within the government. There is a plan to establish a Department of Water within the Ministry, which is currently under Congress review. This initiative is crucial as multiple agencies, including Local Water Utilities Administration (LWUA) (in charge of Presidential Office), Department of Environment and Natural Resources (DENR), and National Water Resources Board (NWRB), require coordination, highlighting the need for a centralized regulatory body.

h) Delay of tariff adjustment by LWUA

The existing tariff was set in 2015 and since then it has been not changed. Water tariffs don't reflect true costs and restrict Metro Cebu's financial capacity for investments. Water tariff adjustment for achieving 10-years plan, which includes an investment plan has been proposed to LWUA in Dec 2022, which has not been approved.

i) Limited financing support

Financing and borrowing are regulated by LWUA. Pending approval limits the borrowing capacity of MCWD. LWUA lending is not functioning. The loan request from MCWD has not been approved. The environment is not favorable for investment projects. Financing remains a challenge, as obtaining a national loan involves complex procedures. To improve the situation, direct funding to MCWD is needed.

j) Limited support and collaboration/coordination with political and government administrations (LGUs, DENR, DPWH, and NWRB)

The metropolitan Cebu is composed of 8 local government units (LGUs). Multiple LGUs cause misaligned plans and conflicting priorities, hindering cohesive water management strategies. LGUs are an obstacle to promoting water projects (no excavation permits for laying pipelines are issued). MCWD needs more support from political and government stakeholders including Department of Public Works and Highways (DPWH) to install pipelines for expansion of service area and replace aged pipelines. Furthermore, surface water source development needs coordination with stakeholders, where water supply sources and facilities including pipelines are located.

k) Unregulated groundwater resource development and management

Groundwater is the main water source of MCWD. In the area, the private sectors are permitted or free to drill private wells which causes a burden on ground water use of MCWD. In addition, an increase in salinity and contamination by nitrate in groundwater reduce their development potential. A close coordination with regulatory bodies such as NWRB and LGUs is important for permission and pollution control.

l) Limited resilience to climate change & disasters

Metro Cebu faces droughts, flooding, and typhoons, reducing water availability and damaging infrastructure. Specifically, during the typhoon in December 2021, when power and water supplies were interrupted, residents seeking water damaged the distribution pipes. As repairs to this damage have not been adequately carried out, the NRW (NRW) ratio, which was previously in the 20% range, now exceeds 30%.

m) Lack of DP support

There is little DP support in terms of technical and financial cooperation (only JICA).

(4) Comprehensive diagnosis of growth spiral

The service coverage ratio has remained at a low level of around 30% over the past four years. The spiral from 1 to 2 is not working well. The spiral from 2 to 3 is working but revenue increase is minimal. Overall financial results are in an up and down trend and not enough for major investment with own funds, but retained earnings are increasing. The spiral from 3 to 4 is not working. The spiral from 4 to 1 is not working well. This may be the critical point to increase capital investment to boost the facility capacity followed by an increase of service coverage and water sales. High NRW, especially leakage, is deteriorating profitability and hindering the effective use of limited water resources.

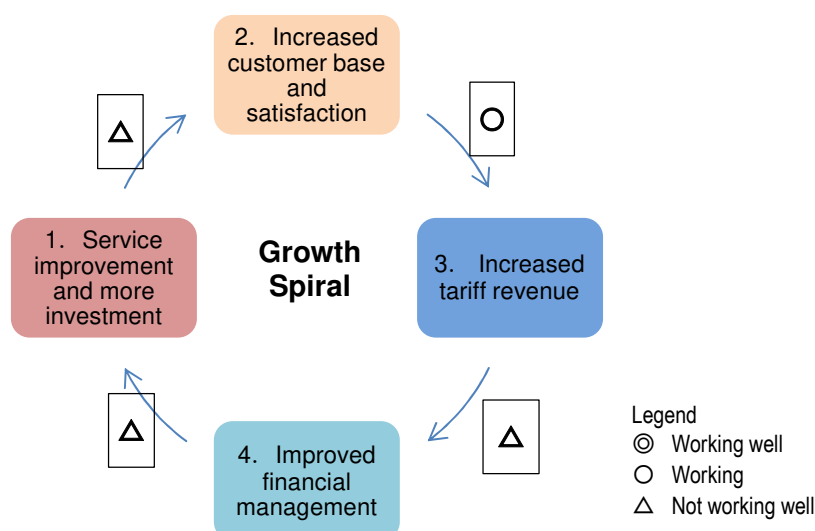


Figure 3-1 Growth Spiral Diagnostic Results (MCWD)

(5) Strategy analysis

In the strategic analysis, higher-level goals were created by combining MCWD's mission, vision, and the contents of higher-level plans. Based on these higher-level goals and considering MCWD's 10-year business plan and other plans, the mid-term goal necessary to activate the growth spiral was set.

■ Mid-term goal: "MCWD expands service coverage by developing and efficiently managing water supply sources and demand, while strengthening self-funding capacity with regulatory and political support."

There may be interconnecting challenges and bottlenecks for the increase of service coverage including water source development and management, infrastructure investment for pipelines, and operational efficiency including high NRW. For overcoming these bottlenecks and paving the way for the utility's growth and resilience, more regulatory and political support will be necessary. The key to functioning the spiral is increased support from regulatory and political bodies, which will lead to an increase in finance and investment for the development of water sources, an increase of customers and a decrease in NRW.

1) Growth steps

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram). By implementing each of these measures, it is possible to create a growth spiral in the form of improved water use efficiency → increased revenue → investment → securing water resources.

1. Prepare a plan for water demand management and efficient water use
2. Prepare a groundwater resource management plan
2. Implement intensive NRW management measures
3. Diversify water sources

1~3. Establish an effective training system

(External factors: Coordination with relevant organizations regarding water resource management and water tariffs)

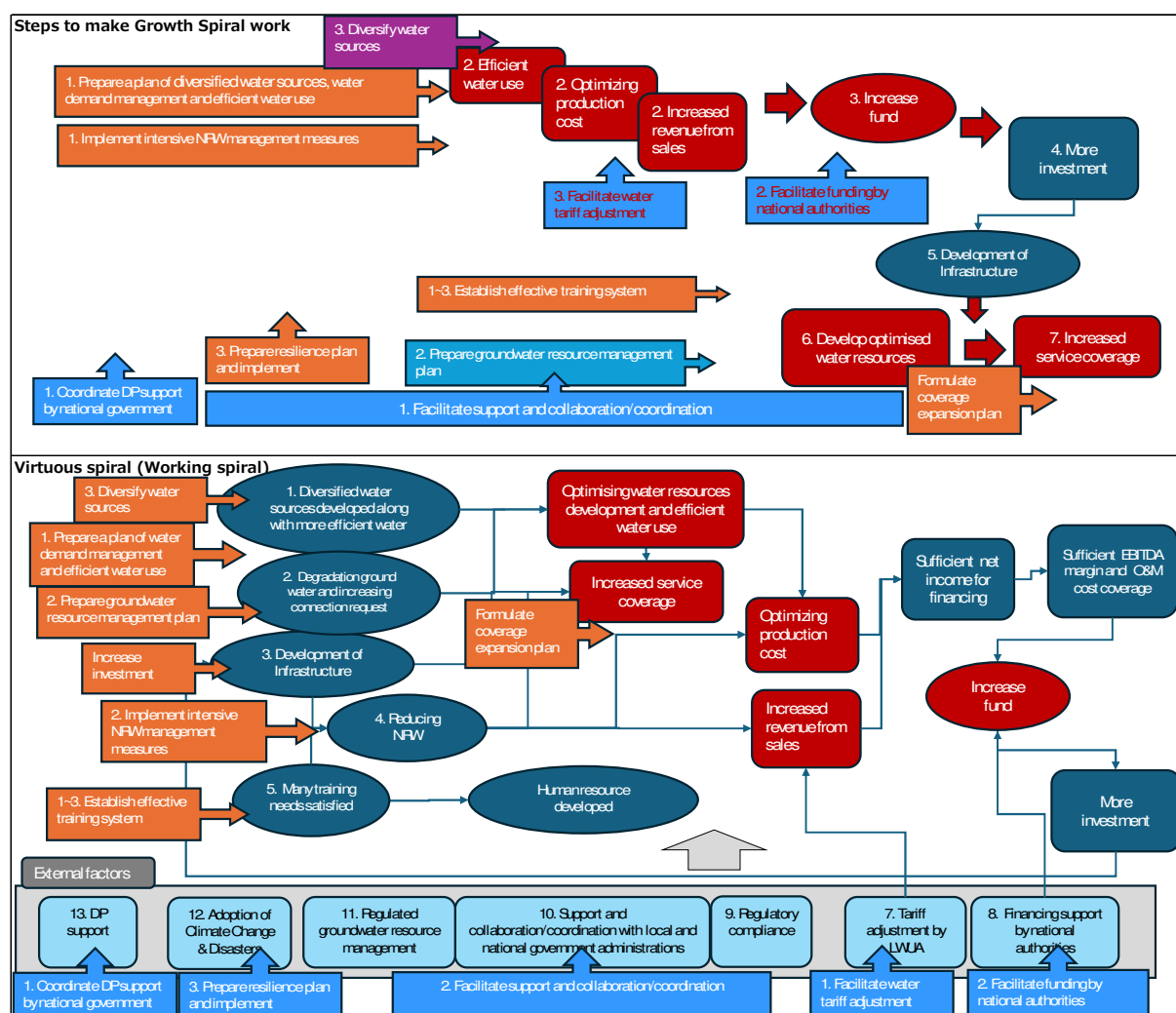


Figure 3-2 Growth Steps (MCWD)

3.1.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to activate MCWD's growth spiral are outlined below.

Outcome 1. A water supply management plan based on water resources management, diversified water sources, water demand management and efficient water use is formulated and implemented.

- 1-1 Assess current water sources, water demand situation, potential sources and efficient water use measures
- 1-2 Develop a long-term, climate-resilient water supply source plan to meet future demand, including both conventional and unconventional water sources such as NRW reduction,

recycled water, desalination, demand management, incorporating cost-benefit analysis

1-3 Implement the water management plan

Outcome 2. Intensive NRW management measures are implemented based on infrastructure updates and capacity development.

2-1 Formulate NRW management plan including infrastructure and capacity building measures

2-2 Strengthen the capacity for NRW management (training) based on district metered area (DMA) management - Pilot project based on existing DMAs for capacity development

2-3 Replace aging transmission and distribution pipelines with restructured zoning and modern technology (Supervisory Control and Data Acquisition (SCADA))

Outcome 3. The groundwater resource management plan is prepared and implemented.

3-1 Implement hydraulic study of groundwater

3-2 Understand groundwater use in Metropolitan Cebu

3-3 Formulate a groundwater resource management plan

Outcome 4. Water sources management is optimized and developed based on the water supply management plan formulated.

4-1 Develop a long-term, climate-resilient water supply source plan to meet future demand, including both conventional water resources and unconventional water sources such as NRW reduction, recycled water, reverse osmosis (RO), and demand management.

4-2 Prepare a mid- and long-term financing plan for water source development and NRW reduction, leveraging LWUA/Development Bank of Philippines (DBP) loans, DP funding, or bulk water offtake agreement

4-3 Implement the formulated plan

Outcome 5. Coverage expansion is implemented based on the coverage expansion plan prepared by MCWD.

5-1 Understand private water supply areas and unserved areas, their needs of MCWD water supply

5-2 Formulate transmission and distribution pipeline plan and implement

5-3 Formulate management and O&M plan in expansion areas.

Outcome 6. An effective training system is implemented using the completed training center.

6-1 Assess the needs of training / capacity development

6-2 Establish a training management system

6-3 Prepare training programs and implement them with priority

(2) Improvement scenarios

After implementing the activities for Outcome 6, the activities for Outcomes 2, 3, and 4, 5 will be carried out in parallel. Finally, the activities for Outcome 1 will be implemented to achieve the mid-term goal. The improvement scenario for MCWD, based on the outcomes and activities, is as follows.

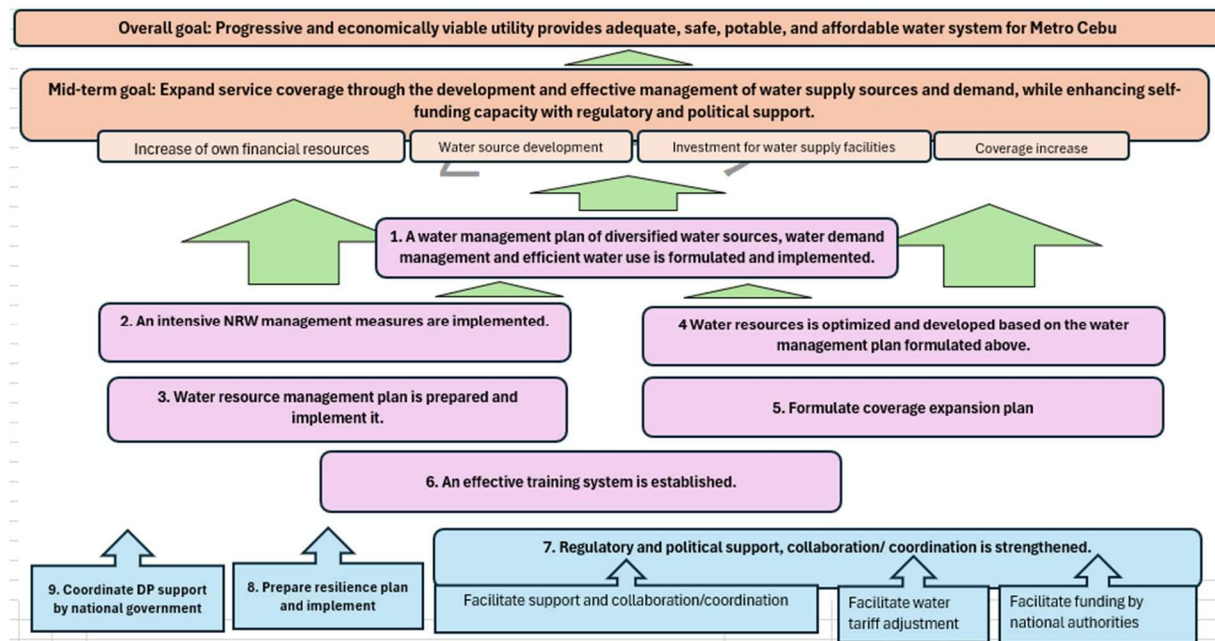


Figure 3-3 Improvement Scenarios (MCWD)

3.1.2. Details of discussions with utility

3.1.2.1. First field survey

(1) Meeting counterparts

The meeting was attended by the General Manager (GM) and heads of five departments. The wrap-up was held at the water quality lab where the site visit was conducted with the head of the planning department; the GM was unable to attend due to another appointment.

(2) Comments on the analysis results and recognized challenges by utility

a) Funding

- There is no financial support from the government at all, and the facility has to be developed with its own funds/borrowing only. Financing through the central government is very time-consuming and therefore requires direct donor support to MCWD. MCWD is aware that Japan has a history of financing through subsidies and government support for the issuance of municipal bonds, and we would like to learn about this system. MCWD would also be grateful if JICA could assist us in introducing this system in the Philippines.
- Borrowing from private commercial banks is not permitted, and financing options are limited to borrowing from LWUA, borrowing from donors, and issuing bonds. However, since there have been no cases of bond issuance in the Philippines, and for that, guidelines need to be established. In addition, LWUA is not seen as a realistic lender because of its lending conditions and LWUA's lending capacity.
- The only Development Partner (DP) support other than JICA was provided by the Netherlands for pipe extension and leakage surveys (2012-2018).

b) Relationship with LWUA, etc.

- The retail water tariff is 24 PHP/m³ and the tariff revision submitted to LWUA in December 2022 is 40 PHP/m³. The tariff revision has not been approved (for unknown reasons, other water districts in the Philippines are reportedly in the same situation), and the company has been operating with the same tariff since 2015.
- The tariff structure is increasing block type and divided into three categories, Residential, Commercial, and Industrial, but these are almost the same level. The next tariff revision after the currently submitted (but not yet approved) tariff revision will be cross-subsidized. The tariff revision is to be done every 5 years.
- The lack of permission from the LGUs to excavate and lay the pipeline is one of the reasons why the water supply expansion has not progressed.

(3) Reactions and views of utility executives on problem-solving approaches (solutions)

a) About the diagnostic and solution analysis

- Some customers in the water supply area are connected to the MCWD pipe network as a backup in case private wells or other water supplies run out, and not all water use is necessarily from the MCWD.
- There are plans to establish 267 DMAs, with 60 DMAs currently in place; MCWD would like to prioritize structuring DMAs in the Mactan Area or the Cebu Area but seeking funds.
- The water pressure is in the range of 7~ 30 psi with an average of about 14 psi¹.
- 93% of NRW is leakage and the rest is basically metering error. Water theft is not that common. However, we believe that 93% may be a bit too much compared to reality.
- Meters are supposed to be replaced every 10 years. The renewal time for meters that have been repaired once is 5~ 7 years. MCWD has a test bench (1" ~ 6").
- MCWD's coverage is 32% as of 2023, and the 10-year business plan aims for expansion up to 70% in 10 years until 2033. This will require an investment of 4 billion PHP, and there is a plan to utilize surface water more than 100 km away as a water source, but this is a last resort, for which there is no funding plan. In addition to the funds, MCWD needs to obtain permits, which will be difficult to obtain since the water pipes pass through many LGUs.
- There are a number of private water utilities. The water quality is not good, and the tariff is higher than MCWD. There are many commercial facilities with private wells in the water supply area, but due to the ongoing salinization of groundwater, etc., requests for connection to MCWD's network are increasing.
- Per capita water consumption at the household level is 160 l/day.
- In 2023 the tariff collection rate is 93% and the target for 2024 is 95%. 73% of customers pay on time whereas the target is 75%. A variety of payment methods are available.
- Prior to 2020, NRW averaged 23% and the minimum was 19%. However, the typhoon in December

¹ 1 psi equals 0.00689476 MPa, multiplying by 14 gives approximately 0.097 MPa.

2021 disrupted the water supply (and electricity) facility and consequently the water supply stopped, and therefore, residents seeking drinking water destroyed facilities. This raised the NRW up to 42%. Currently, efforts are being made to lower the increased NRW.

- MCWD receives a bulk water supply from a private bulk supplier (including groundwater, surface water, and seawater or brackish water desalination) and purchases at 73 PHP/m³. The retail price is 24 PHP/m³, meaning MCWD pays higher for buying than selling.
- B/S Inter-Agency Payable is Revenue Share of water source costs to the LGU that owns the water source.
- The P/L Shares, Grants and Donations amortizes past Grants is the amortization of Netherlands grand.
- Generation, Transmission and Operation Expenses, which accounts for 42% of operating expenses, is the cost of receiving water from bulk suppliers under an off-take agreement for approximately 20 years. Under the contract, the purchased water volume and price are set, and both parties are monitoring the water volume.
- Groundwater is becoming saline due to over-pumping, and contaminated due to nitrate contamination from pesticides and fecal matter, and there is virtually no room for future development of groundwater because more water is being pumped than is being recharged.
- All meters are postpaid mechanical meters, and the installation rate is 100%. There is room to consider demand management using smart meters, etc. as a future solution to water shortages, but only after the target water coverage rate is achieved and the DMA is completed.

b) Reactions and Views

- Basically, MCWD agrees with the proposed diagnostic and solution analysis.
- There is a statement that there is a lack of communication with the relevant agencies, but although we have ensured a reasonable frequency, political factors are intertwined, and MCWD cannot move forward. Therefore, MCWD would like the JICA Study Team to consider the wording, taking these circumstances into account.

(4) Action plan

In consultation with the executives, the action plan was agreed as the preparation of a document to take the first steps in the direction of the improvements shared and discussed during the field survey. In the long term it will benefit the utility. The Action Plan is as follows. All materials were submitted.

Table3-2 MCWD Action Plan

No.	Materials	Received or not
1	Provide answers to questionnaire and materials requested (2nd week of December 2024)	OK
2	Make comments on Water Utility Performance Analysis and revise it (2nd week of December 2024)	OK
3	Identify the areas, approaches, and measures of collaboration with LWUA, Department of Environment and Natural Resources (DENR), Department of public work and highways (DPWH), National Water Resources Board (NWRB), LGUs for improving water supply service and performance (2nd week 2024)	OK
4	Provide training concept notes (2nd week of December 2024)	OK

No.	Materials	Received or not
5	(2nd site request) Verification of data on collection ratios (80%?) What are the contents of efficient water distribution and required training contents? A report of 10-year business plan Procedure of tariff adjustment (cycle, etc.) Priority of training program and significance Water source amount developed (m ³ /d) Water source saved by more efficient use (m ³ /d) The comments on analysis by GM and needs for addition and improvement	OK

(5) Executive's awareness of problems and willingness to improve the organization

a) Biographies of Executives (GM), etc.

- The current General Manager (GM) retired at age 50 after 30 years working for MCWD. At the time of retirement, he was the Deputy General Manager of Finance (DGM). He then worked for a private water company and came back to MCWD as GM in 2022. GM's background is in finance and an accountant. The previous GM was an engineer, and the previous GMs were basically engineers. The current GM is the second GM with a finance background.
- The board member is appointed by the Mayor of Cebu and the Board member appoints the GM. The mayor has a 3-year term, and the Board and GM have a 6-year term. The challenge is that since the mayor serves a 3-year term, the Board Member may change when a new Mayor is appointed. In fact, the BOD changed in October 2024; the GM is appointed by the Board of Directors (BOD). The terms of the contract are such that they can be terminated at any time.

b) Executive awareness of problems and willingness to improve the organization

In terms of the problem, we recognize that the reduction of NRW is an urgent issue. In addition, the increase in water tariff, coordination with LWUA regarding borrowing, and coordination with LGUs regarding drilling are also barriers to the promotion of the water supply business. Change Management is being implemented as an internal reform. Organizational improvements are being made based on results from the top to the bottom. Management improvement plans are developed together with the Corporate Planning Department and are coordinated at all organizational levels (all group managers and various unions). The motivation for the staff is to give them work immediately (Equal Opportunity). It is in line with MCWD's Value. MCWD also places importance on customer opinions. MCWD listens to the opinions of our customers through our customer box, SNS, etc. MCWD is educating its employees about reverse osmosis (RO) as MCWD is considering operating its own RO in the future.

c) Impressions of the Research Team

During the discussions, they sincerely answered the survey team's questions. In addition to the GMs, the younger staff members have a good understanding of the environment surrounding MCWD (e.g., its relationship with LWUA and LGUs) as well as the issues facing individual departments, and we feel that they share a more comprehensive view on the issues.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	3 GM has worked at MCWD for a long time and is aware of all the issues. He often shares these with staff.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	3 GM is working by presenting our vision and mission in annual plans and other documents.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	2 GM assesses the situation and responds accordingly.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	3 The current status of services and facilities is managed by each department using GIS, and reports and contracts can be created efficiently. Introduction of SCADA is planned.

(6) Comparison with desktop survey results

The field survey added groundwater degradation (and increased connection applications) and seven external factors, revised the strategy analysis (Mid-Term Goals), and added solutions. In addition to water source development, MCWD indicated a high need for training and a willingness to increase the coverage rate.

a) Additional barriers

- Groundwater degradation (and increased connection request)

b) Additional external factors

- Limited supply of funds
- Fragmentation of regulations
- LWUA delays rate revision
- Limited financial support
- Limited cooperation and coordination with political and administrative bodies
- Limited resilience to climate change and disasters
- Limited support from development partners (DPs)

c) Changes in Strategic Analysis

- Strengthening of organizational governance created at the time of DS is not required. Instead, a human resource development plan and a water supply business plan were added, as well as systematic capacity building through their implementation. Customer orientation is a key goal of the current organization.

d) Added Solution

- A groundwater resource management plan will be developed and implemented.
- The expansion of the water supply area will be implemented in accordance with the coverage expansion plan developed by MCWD.
- The completed training center will be used to implement an effective training system.

e) Responding to External Factors

- Regulatory and political support, cooperation, and coordination will be strengthened.
- Promote revision of water rates
- Facilitate financing by state authorities
- Facilitate support, cooperation, and partnerships with local and national government agencies
- A water supply resilience plan will be developed in conjunction with the water supply management plan.
- Coordinate national government support for development partners (DPs).

3.1.2.2. Second field survey

(1) Meeting counterpart

The GM and planning department executives participated in the general briefing. The wrap-up was conducted with the planning department executives.

(2) Challenges perceived by the counterpart

a) Funding

- Financing is a challenge. Borrowing a government loan is difficult due to many steps; direct financing to MCWD is needed; Development Bank of the Philippines has an interest rate of 3.9%.
- The challenge of external factors (many regulatory agencies) is due to the lack of a unified department of water administration in the government. Currently, there are plans to create a Department of Water (Department of Water) in the ministry in charge. It is passed to the National Assembly. Coordination with many agencies has become necessary, and a unified department for water is needed. Regulations are fragmented.
- Although there are internal reserves, these are insufficient for large development expenditures such as water resources. Only small infrastructure investments are possible; National Bank investments are very short-term and on an emergency basis.
- LGU participation is required to finance water sources.

b) Improving Coverage Rates

- The 10-year business plan includes a plan for extension of the coverage rate. There are two types of private operators: drilling wells and using them as a self-supply source of water, and developing a pipe network and supplying water by means of wells. This is a very small scale, with only 5-7 operators. Although data on the respective coverage rates are not available, the approximate is that 3% of the water supply is from water wells and the other 65% is from wells as a self-supply source. The water quality of private businesses that use groundwater as their source of intake is deteriorating. The deterioration of groundwater quality has led to some connection requests to MCWD. On a large scale, Sam Migel (a beer company) has requested MCWD connection as an additional water source as their groundwater has become saline. These are large well sources, but not many. Many are small well sources.

c) About Water Sources

- There is a plan to develop a surface water source from Bohol province, but it is difficult to meet the relevant regulations; LGU permits are difficult to obtain, so LGU participation is required. Since it is a long-distance water pipeline, the water volume must be large to be profitable. On the other hand, a desalination facility (RO) would be profitable at least in terms of capacity. There are other potential water sources in Cebu Island: Tobran (60 km) and Bajan (100 km).

d) Regulations

- LGU will not allow expansion of pipe network. For unknown reasons, since the NWRB branch office is not located in Cebu, water source developers go to the headquarters in Manila to apply. They issue the permit without assessing the impact on the groundwater source.

e) About Private Water Service Providers

- Private water suppliers are not licensed by LWUA, but LGU issues commercial licenses.
- There is a precedent concerning water-supply areas in which MCWD lost the case. As for areas without water supply, MCWD cannot provide water on a preferential basis. The decision should be made with consideration for the welfare of the residents.
- Although no data is available, private water suppliers charge high rates.

f) Setting Water tariff

- Applications for water tariffs are made on an as-needed basis. The basic rule is every 5 years, because Public Hearing is valid for 5 years.

g) NRW

- For measures addressing commercial losses (CL), the cost of smart meters remains a challenge.
- Approximately 5% of the loss is categorized as CL, but further scrutiny is needed. We would like to learn about the Water Balance Table by the WB. Since the estimation of CL is based on actual data from complaints and the discovery of illegal connections, it may be underestimated.

(3) Reactions and views of utility executives on solutions and approaches

a) GM comments

The diagnostic and solutions form is a very comprehensive analysis. He wondered if there was an existing format and was it created by filling in the existing format (the JICA Study Team: developed and analyzed the format for this project). GM requested to share the final version once updated.

b) Data on diagnostic and solution analysis

- With respect to the 35-indicator evaluation, the utilization rate of the production facilities is at critical numbers. Revenue is growing. The collection rate is not good (data to be re-examined). The leakage rate accounts for 95% and the commercial loss is 5%, but this needs to be scrutinized in the future.
- Currently 20 DMAs are in operation with flow meters also installed. Most of the DMAs have less than 20%, but some (2~ 3) have high.

- Replacement of old pipes is also planned in the budget (120+ 50 million PHP). 3 areas were selected as top priority areas, including Mactan. Implementation will require rate revisions.
- Renewing old pipes is important, but soft components are also important; would like to receive training from JICA.
- Renewal of old pipes was done by Asset Management. The necessary replacement pipes were selected according to the conditions (in order of (1) leakage occurrence, (2) pipe age, (3) pipe material, and (4) location (high NRW ratio).
- Subsurface leakage exploration is a challenge.
- We want to do the DMA in different layers. First, we want to zone each LGU and then set up a Subdivision and further DMA below that.

c) Improvement steps

- Investment activities are needed first. This requires an increase in water tariff.
- Need to reduce NRW, improve operational efficiency, and generate more revenue.
- Improve efficiency of facility operation (Piso water treatment plant not in operation: the JICA Study Team); it is an old facility (100 years old) and not in use. Alternatively, water sources are inadequate.
- The training should take into account the long-term perspective (next 5 years) and learn about RO operation and maintenance. Measures to prevent NRW are also important. An efficient water distribution operation is equally important.
- There is also a plan to expand coverage. Permission from LGUs (pipeline installation) is required for coverage expansion

d) About goals

- The 2030 target for NRW is 25%. This year's NRW target is 31%. The NRW reduction plan is in the 10-year Business Plan. Only implementation is required.

3.1.3. Details of discussions with other organizations

3.1.3.1. Government institutions

(1) NWRB

a) Regulation of water resources management and water supply services

- The NWRB has three functions: water resources management for the Philippines as a whole, regulation of all water use and withdrawal, and regulation of water utilities.
- For water resource management in the Philippines as a whole, new water withdrawals require permits, license registration fees, and payment of annual water withdrawal fees. In addition to surface water and groundwater, seawater is also subject to this requirement. This applies to all operators (water supply (Water District (WD) and private operators), irrigation, hydropower, etc.). For domestic wells, a one-time fee is charged for registration and enrollment. All other businesses will be charged based on the amount of water used per year.
- Regarding the regulation of water utilities, Manila Water and Maynilad are regulated by Metropolitan Waterworks and Sewerage System (MWSS), WDs by LWUA, and private water

utilities by NWRB. Therefore, it is possible to have multiple utilities licensed in the same area. In Cebu, MCWD had previously monopolized the water supply business in a certain area, and private companies were not allowed to enter the market.

- It is unclear which WDs will regulate the water service in the case of a JV with a private contractor.
- Many WDs are not licensed for all water use and withdrawal regulations, so they signed a memorandum with the LWUA and a rule went into effect requiring them to be licensed; within 6 months all unlicensed WDs must obtain a license from the NWRB.
- The NWRB also grants permits for agricultural water withdrawals; of the water withdrawals permitted by the NWRB, 70-80% are for agricultural use on a volume basis. The DENR is taking measures to increase the water use efficiency of irrigation, which ideally should be 50~ 60%.
- There are many illegal private companies and irrigation companies that have not obtained water withdrawal licenses, and the identification has been intensified. The DNER regional office is working on the identification of unlicensed and licensed water withdrawal.
- Regarding dam construction, the competent ministry in charge depends on the use of the dam. However, in recent years, multi-purpose dams have been increasingly constructed. In the case of multi-purpose dams, it is important to determine the priority of supply destinations when the water storage volume decreases during the dry season (April~ May). When the water level decreases to a certain level, priority is given to supply certain sectors (e.g., only drinking water is supplied when the dam water level drops below 180 m). The highest priority is drinking water supply. This was implemented last year during El Nino.
- MCWD has nitric acid contamination and heard that LWUA has shut down the contaminated wells.
- When MCWD expands its water supply area, if the water source is a river, the amount of water that can be withdrawn is calculated by subtracting the existing water withdrawal from the river water volume.
- Water resource policies include the Integrated water resource management plan, WWS MP, National WSP, and PPD Plan.
- Bulk water supply is also regulated.

(2) Local Water Utility Administration (LWUA)

a) The role of the LWUA

- The scope of work to be performed by the LWUA is as follows
 - Institution building and regulation for WD management
 - Technical assistance to WD
 - Funding for WD
- Regarding funding for WDs, most forms of funding are Regular Loans to WDs, which are loans made using either government or donor funds. The funds are used for facility construction. Currently, ADB is providing Loan to WD in Cotapato and other WDs. MCWD in Cebu does not currently receive any ADB funds, and is paying 4% interest, but is considering reviewing its loan structure since it is not as competitive as the Development Bank of the Philippines and Land Bank of the Philippines.

- In FY2023, a large grant was provided.

b) Revision of WD tariff

- For MCWD, we are still waiting for LWUA Board approval.
- Only up to 60% of the price can be raised at one time. Tariff levels are capped at 5% of household income for Low-income groups.
- Regarding the difference in tariff between WD and private water utilities, we believe it is somewhat reasonable because private water utilities are subject to a 12% income tax (WD is not). In addition, private utilities are capped on their profits as they can only make profits up to 12%.
- The coexistence of a private water utility regulated by the NWRB and a WD regulated by the LWUA in the same area, and sometimes overlapping supply areas, is not considered a problem because monopolies are prohibited by the Constitution.

c) Others

- In addition to about 500 WDs, there are 1,700 LGU-operated utilities in the Philippines.
- When a JV is formed with a private operator, it is managed by WD's contract management unit and is subject to LWUA regulations.
- The reasons for shifting to JVs are not only lack of funds, but there are also cases where JVs are formed even in cases where sufficient funds are available; the benefits of JV formation are various, including utilization of private-sector funds, improvement of services, and management integration in the region.
- The only water source with development potential in Metro Cebu is seawater. It is unclear whether it is economically and financially feasible, even if technically feasible, to develop a river more than 100 km away, which MCWD intends to develop in the long term.
- In some cases, a WD supplies water to another WD.
- There is a loan for NRW reduction.
- Raise the following as technical issues for LWUA. In particular, regarding "limited ways to manage WD's KPIs," they would like to build a data sharing platform.
 - Limited ways to manage WD's KPIs
 - Limited financial resources available to provide
 - Limited resources available locally to provide technical assistance to WD
- LWUA has around 400 employees, including staff in not only the technical field but also in finance and other areas.

3.1.3.2. Development partners

No interviews with DP as there are currently no DP providing assistance to MCWD.

3.2. Solomon Water Authority (SIWA)

3.2.1. Results of utility analysis

3.2.1.1. Results of analysis after desktop survey and field study

(1) Updated Indicators

Table3-3 Key Performance Indicators (SIWA)

KPI #	KPI	Data(FY2022/23)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (SBD)	-	-	-
2	Production capacity (m³/day)	47,965	-	↗
3	Production (m³/day)	36,885	-	↗
4	Utilization ratio of production capacity (%)	77	-	→
5	Continuity of Service (Hrs/day)	23.4	2	→
6	Quality of water supplied (Compliance rate: %)	96.2	4	→
7	Water supply pressure	Average 8m, 100m in some areas	-	→
8	Leakage ratio (%)	42	-	→
	2.Increased customer base and satisfaction			
9	Population served	65,000	-	-
10	Service coverage / Water coverage (%)	74	2	→
11	Customer satisfaction (%)	-	-	→
12	Water sold (m³/day)	14,797	-	→
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	227.6	-	-
	3.Increased tariff revenue			
14	Turnover from sales (SBD)	132,725,843	-	↗
15	Collection ratio (%)	96	3	↗
16	NRW ratio (%)	60.0	1	→
17	Metering ratio (%)	100	4	↗
18	Water tariff level (USD/6m³)	51.2	-	↗
	4.Improved financial management			
19	Accounting system	IFRS (Accrual basis)	3	-
20	Net income (SBD)	6,865,781	-	↘
21	EBITDA (SBD)	26,481,426	-	→
22	EBITDA margin (%)	20	2	→
23	EBITDA margin excl. deferred income (%)	11	2	↗
24	Total capital operating margin (%)	1	-	↘
25	Operating Profit Margin (%)	5	2	↘
26	Equity ratio (%)	48	3	↘
27	Fixed long term conformity rate (%)	90	3	↗
28	O&M cost coverage ratio excluding subsidies (%)	111	2	↗
29	O&M cost coverage ratio (%)	121	2	→
30	Unit cost of water supply (SBD /m³) (Overall cost including DEP/Water sold)	25.4	-	→
31	Supply price (SBD /m³) (Turnover from sales/ Water sold)	25	-	→
32	Subsidies (SBD)	165,218	-	↘
33	Development Partner grant support (SBD)	12,379,860	-	→
34	The ratio of subsidies and DP support to turnover	9.5	-	↘
35	Number of staff per 1,000 connections	12	1	→
	GDP per capita (USD)	2,041.6		
	Inflation rate (%)	5.89		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis

1) Summary

- SIWA generates a minimum profit but largely depends on government and donor grant for capital investment. On the cost side, expenses on salaries and employee benefits approximately account for 30%, which is relatively high. About the Balance sheet, evaluation surplus and deferred revenue (Government and DP grants) account for its major part, and the retained earnings are limited. Therefore, it is necessary to check what contributed to the revenue-cost balance (such as NRW and staff cost) to ensure sustainable operation.

2) Positive

- The revenue from customers has been increasing by 10% on average and profit is also upward in general.
- The Utility is investing in equipment within the scope of cash-in subsidies as it is highly dependent on subsidies. Particularly in 2021-2023, grant money is invested in the utility and therefore the size of the balance sheet doubled in the 2 years.
- The equity ratio is about 50%, indicating a high degree of financial stability.
- In 2022, the surplus of operating cash is also invested in the acquisition of plant and equipment.

3) Negative

- The operating cost coverage ratio is 121%, but excluding subsidies, it is a relatively low level at 110%.
- Impairment loss, which is the loss of income due to unsuccessful collection accounts for 5-10% of total cost.
- Long-term subsidies from governments and donors are recorded as deferred revenue, accounting for about 47% of total assets. The company is highly dependent on subsidies for capital investment.
- The accounts receivable turnover is 152 days, which is much more than the tariff collection cycle, 1 month

(3) Summary of bottleneck analysis

(Internal Factors)

a) Unknown customer satisfaction

- Approximately 1,000 inquiries and complaints are received from customers per month. Complaints are varied and include water supply disruptions, reports of illegal connections and leaks, insufficient water pressure, and water charges. The most common type of complaint is reports of leaks.
- The survey on customer satisfaction or willingness-to-pay has not been carried out. The CEO advocates customer-focus. To promote customer focus, it is important to conduct a customer satisfaction survey, for which external support is needed. Customer feedback is important for operations' improvement.

b) Increase in illegal connections due to strict enforcement of disconnections

- Approximately 85% of customers do not pay on time. Total unpaid water bill amounts to SBD 1

million. The collection rate was 84% in 2021 but improved to 96% in 2023. The reason for the improvement is the disconnection of customers with late payments and the introduction of pre-paid meters.

- To enhance the water supply coverage rate, the number of connected customers has increased from 9,600 (2016) to 18,500 (present). However, there were many overdue bills, and SIWA has strictly implemented its response to disconnections for non-payment. As a result, 5,000 connections have been disconnected so far. However, since the disconnected customers do not have alternative water sources, it is highly likely that they are illegally connected to SIWA's water pipes. As a result, only customers who pay the bill remain, and the amount of water tariffs collected has not increased much in the past year, resulting in only an improvement in the ratio of collection of bills. All but 50 customers have had meters installed, but there is the problem of measurement errors with the old meters. A cash (prepaid) water meter has been introduced but it is not functioning well.

c) High water bills due to continuous tariff increases

- The cost of materials has increased, forcing SIWA to raise water tariffs. In 2016, the water tariff for the minimum flow range was 4.89 SBD, but in 2024 it will be more than 9 SBD. Unit price and unit cost per m³ of water sold are high. The water charge constitutes about 15% of household income according to JICA project report. Due in part to high water tariffs, many unpaid users remain unable to pay their bills or steal water. Water charges are very high, and it is recognized that NRW and electricity costs have a major impact.

d) High NRW

- The NRW department, established in 2020, lacks medium- to long-term planning and sufficient human resources. Frequent personnel transfers have hindered progress, and only 2 of the 15 technicians trained under the JICA project remain. Additionally, the NRW team leader is frequently replaced. Although a pilot DMA during the JICA project achieved NRW reduction, the absence of a comprehensive NRW plan has prevented sustained efforts. Furthermore, while step tests and flow meters are used in 28 DMAs to identify NRW, resources such as leak detection devices (of which only one set is available) are insufficient for broader implementation.

e) Less human resources capacity development

- Due to frequent personnel changes, the capacity of staff has not been sufficiently strengthened. Lack of competent technical personnel has caused delays and problems in DP project processes, etc. Recruitment of quality and skilled staff remains a serious issue. The average length of staff stay is 6 years. The turnover rate over the past 3 years has been high. One of the reasons is the Ausie Mobility Partnership system that has resulted in an increase in staff members going to Australia to work. Capacity building is a critical component of SIWA's strategic and annual work program. However, due to lack of funding, it has not been implemented sufficiently. Staff training is provided where it is facilitated and supported by DPs and funded under specific DP projects. The number of staff per 1,000 connections is 12, which indicates human resource capacity needs to be developed.

(External Factors)

f) High turbidity problem in raw water in heavy rain

- Illegal commercial logging and poorly managed logging activities are causing deforestation upstream of the water source (an external factor). When it rains upstream, the water becomes highly turbid with abundant mud and soil particles forcing a suspension of water supply. In 2024, the total number of days with suspended water supply is 27.

g) Potential collaboration and coordination activities with key stakeholders

- For the sustainability of the operation of SIWA, profitability is pursued. The removal from the position of State-Owned Enterprise (SOE) in August 2024 made the position of SIWA unclear in future. To tackle illegal connections, SIWA is trying to work with the police. To deal with the high level of turbidity in water resources due to commercial logging, SIWA needs to coordinate with relevant ministries. To reduce the cost of water supply, SIWA may need to work with the Ministry of Mines, Energy and Rural Electrification (MMERE) for the reduction of energy costs.

(4) Overall diagnostics of growth spiral

Water services have improved, but the service coverage and financial situation have not improved much. Three spirals may not be functioning well but the increase in customers leading to an increase in tariff revenue is working.

The trend in water production and continuity of service is positive, and the quality of water supplied is good, so it is considered that the water supply service is improving. However, service coverage is stagnant, and customer satisfaction is potentially not high.

NRW is very high at around 60%. The high number of staff per 1,000 connections can lead to high labor costs. Although the turnover has increased slightly, the net profit is decreasing. The O&M cost coverage ratio excluding subsidies is not high (around 110%), which indicates insufficiency of internal funds, and the utility cannot invest in major infrastructure from its own resources.

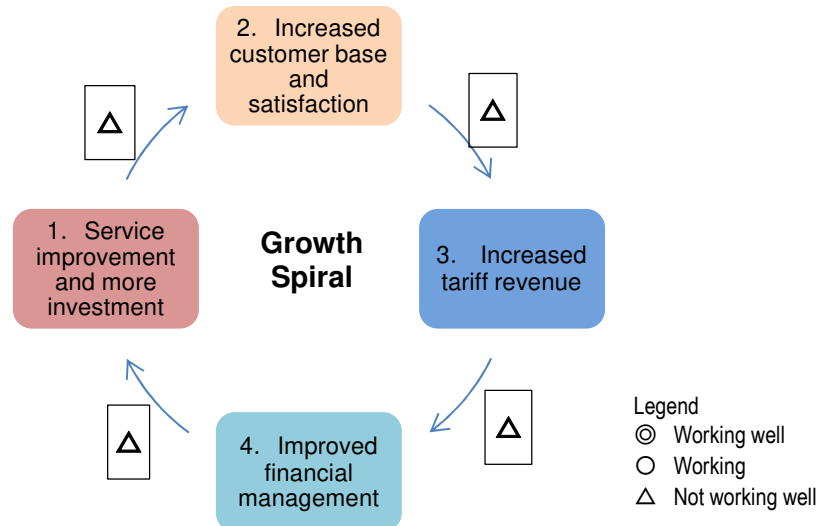


Figure 3-4 Growth Spiral Diagnostic Results (SIWA)

(5) Strategic analysis

In the strategic analysis, the SIWA's mission and vision were combined to create a set of high-level goals. Under those high-level goals, the mid-term goal necessary to turn the growth spiral around was established based on SIWA's strategic plan and other plans.

■ Mid-term goal: "SIWA transforms into a financially self-sustained, customer-focused water utility implementing effective management practices, developing human resources, and strengthening NRW (NRW) management"

This customer-focused organizational transformation is a priority aligned with the Five-Year Corporate Strategic Plan and is foundational to making the growth spiral of SIWA functional.

1) Growth steps

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram). By implementing each of these measures, it is possible to create a growth spiral by setting tariffs considering customer affordability and reducing NRW.

1. Understand customer satisfaction and tariff review
2. Strengthen customer-oriented service
3. Improve services
4. Implement illegal connection measures and production optimization (SCADA)
5. Improve meter management measures (prepaid water meter functioning)
6. Enhance the organizational capacity of NRW management and implement the NRW management plan
- 1 - 6. Establish training system
7. Lower or adjust the water tariff

8. Renew aged pipes

9. Restore water resource

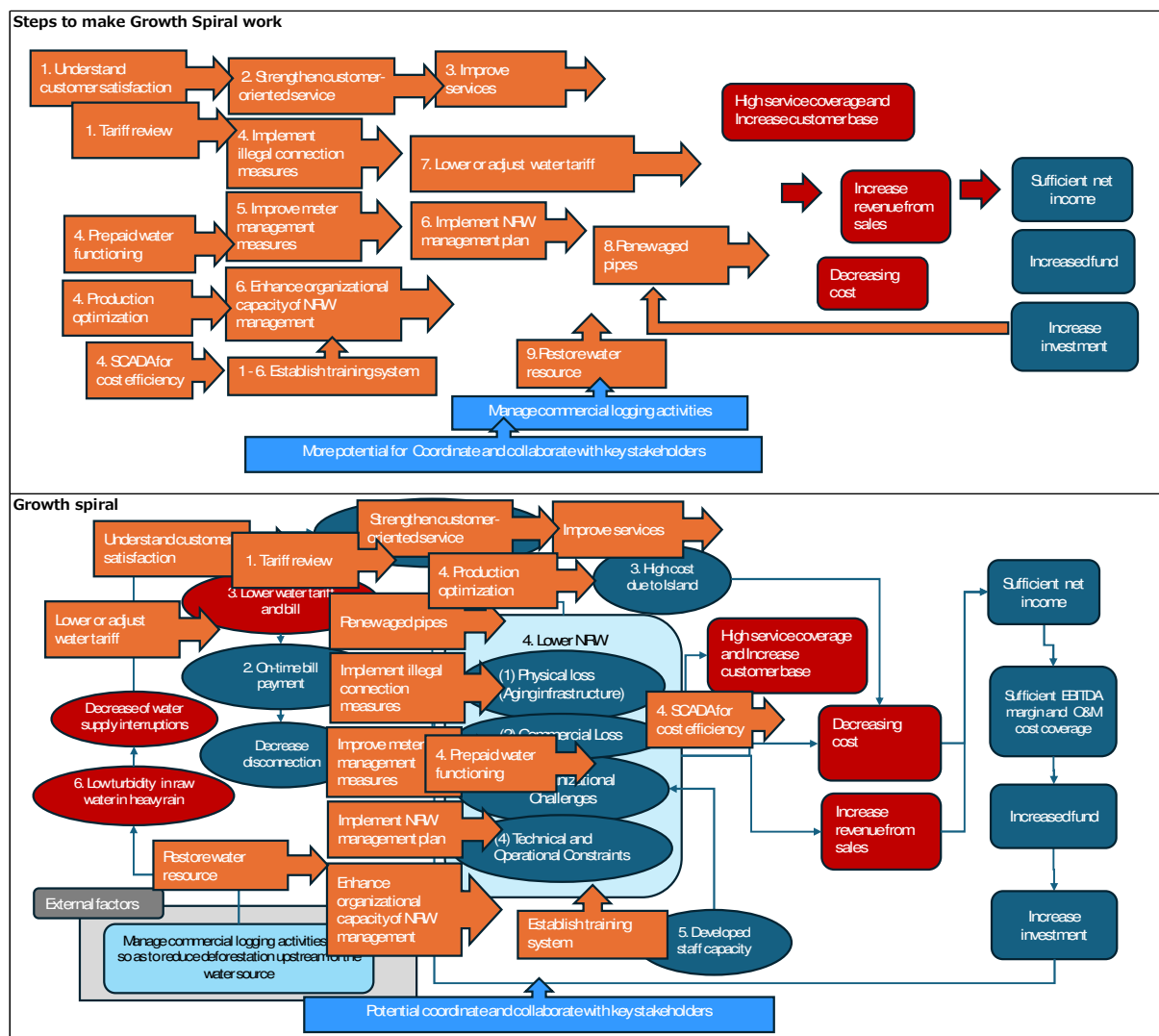


Figure 3-5 Growth Steps (SIWA)

3.2.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to activate SIWA's growth spiral are outlined below.

Outcome 1. Customer-oriented service is strengthened.

- 1-1 Understand customer satisfaction
- 1-2 Formulate a customer-oriented service plan
- 1-3 Strengthen customer-oriented service

Outcome 2. NRW management is implemented.

- 2-1 Formulate NRW management plan based on the previous JICA project
- 2-2 Strengthen comprehensive NRW management capacity
- 2-3 Implement NRW management plan

Outcome 3. Water tariff is lower or adjusted considering affordability.

- 3-1 Prepare a road map to reduce or adjust the water tariff
- 3-2 Implement a road map

Outcome 4. Training system is established.

- 4-1 Assess existing HR by capacity reviewing the existing organizational reform and transformation plan
- 4-2 Prepare a human resource development and training plan
- 4-3 Implement the human resource development plan

Outcome 5. Aged pipes are renewed.

- 5-1 Formulate an aged pipe replacement plan with modern network technology
- 5-2 Restructure and modernize the transmission and distribution system

Outcome 6. Water resources are restored.

- 6-1 Assess the existing situation of deforestation
- 6-2 Prepare a management plan for commercial logging activities
- 6-3 Implement management plan

Outcome 7. Coordination and collaboration with key stakeholders are improved.

- 7-1 Identify the areas, approaches, and measures of collaboration and coordination with key stakeholders (MMERE, MEF, Police, etc.) for improving water supply service and performance
- 7-2 Enhance collaboration with key stakeholders

(2) Improvement scenarios

By implementing the activities for Outcomes 1 and 4, Outcomes 2 and 3, and Outcomes 5 and 6 in parallel, the mid-term goal will be achieved. The improvement scenario for SIWA, based on the outcomes and activities, is as follows.

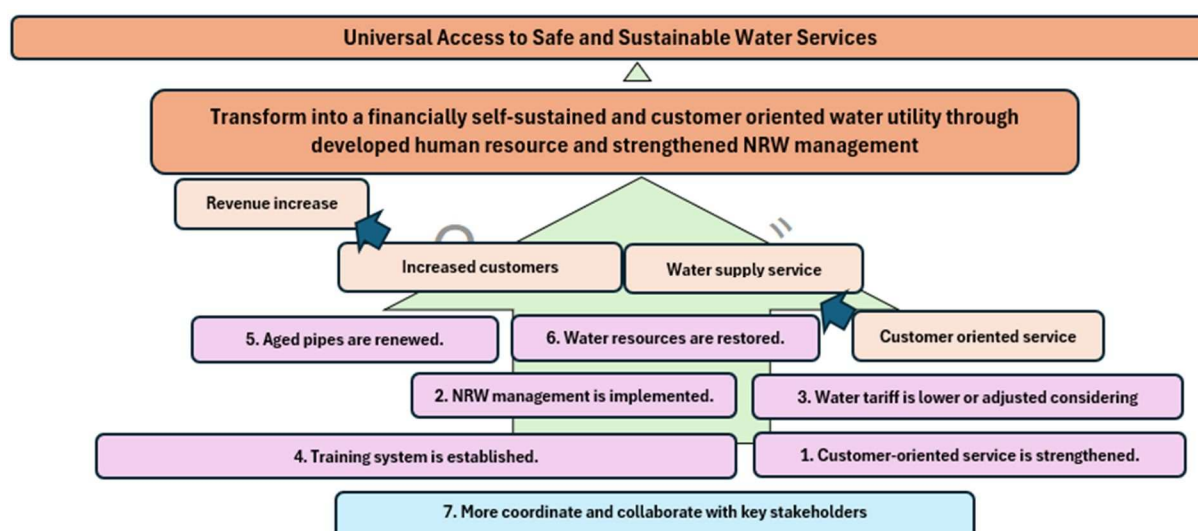


Figure 3-6 Improvement Scenarios (SIWA)

3.2.2. Details of discussions with utility

3.2.2.1. First field survey

(1) Meeting counterpart

The executive briefing meeting was attended by the CEO and all key departmental executives. Similarly, a wrap-up meeting was held with the participation of the CEO and executives.

(2) Comments on the analysis results and recognized challenges by utility

a) Interruption of water supply due to increased turbidity in rainy weather caused by logging of forest in water sources

The challenge for the water service is the interruption of water supply during high turbidity of raw water during the rainy season. This is due to commercial logging at the upstream of the water source. Department of Foreign Affairs and Trade of Australis (DFAT) has conducted an assessment of logging watersheds. The World bank and Asian Development Bank (ADB) are implementing watershed management activities. The main activity is to provide alternatives to logging, using carbon trading and payment of ecosystem.

b) High NRW

- The NRW rate is approximately 60%, with water leaks and illegal connections being the main problems. There are also metering errors in some water meters.
- An action plan has been developed for illegal connections and will be handled in cooperation with the police, as enforcement involves safety risks for staff members. Approximately 85% of customers do not pay on time (only 15% pay on time). Total outstanding receivables amount to SBD 1 million.
- Many of the pipelines were constructed in the early years of independence in 1978, and the frequency of leakage is high due to the aging of infrastructure (about 4,000 leakages per year). The

priority pipeline for replacement (diameter ranging from 100 to 300mm) is set at 80 km, of which 10 km is planned to be replaced by the UWSSP project of World Bank and ADB in areas where the pipelines are old and have high leakage frequency. This UWSSP project component does not include technical cooperation.

- The water pressure is being measured with a portable data logger. Localized high water pressure is also a problem, so they are planning to install PRVs (pressure reducing valves).
- There are 28 DMAs in the distribution area, all with flow meters installed and in operation; flow measurements are taken once a week and the NRW ratio is calculated. A step test is performed at DMAs with high non-yielding water. There are many valves for step tests.
- In JICA's past technical cooperation project on NRW, reductions were achieved through a pilot DMA, but there is no comprehensive plan for technology transfer to sustain these reductions or for expanding NRW reduction activities to a wider area. Since there is only one set of leak detection equipment available, only one team can operate, preventing any expansion of the activities. To implement these measures in other regions, four sets of equipment would be necessary.
- The water distribution pipes are made of PVC, but they are weak against impact and prone to leakage at the joints. Therefore, SIWA would like to change to HDPE pipes, but HDPE pipes are more expensive than PVC pipes.
- A NRW section has already been established. A team of 30 staff manages only physical losses, and there is no special team to deal with commercial losses, but customer service does. There is no mid- to long-term plan to comprehensively reduce physical and commercial losses, nor is there a personnel plan for this purpose. The JICA NRW Technical project provided training to 15 SIWA engineers. However, only two members who received training at that time remain. Thus, 28 of the 30 members of the NRW Section have never received any systematic training.
- Regarding metering errors, SIWA has two sets of portable test kits and one set for bulk meters, which are used to address the issue. Many of the water meters have already been installed for 20 years.

c) High water tariff and potential illegal connections

- Especially after COVID-19, the cost of fuel has increased significantly, and the cost of materials (due to the rising cost of transportation resulting from increased fuel costs in the islands) has skyrocketed, forcing water tariff to increase. In 2016, the water tariff in the minimum flow range was 4.89 SBD, but in 2024 it is over 9 SBD.
- The number of connected customers rose from 9,600 (2016) to 18,500 (as of 2024) due to increased water supply coverage, but there were also many customers not paying the water bills, so the SIWA stepped up its response to water supply disconnections for nonpayment. As a result, 5,000 connections have been disconnected so far. However, since these customers do not have an alternative water source, it is highly likely that they are illegally connected to SIWA's distribution pipes. As a result, only customers who are willing to pay the water bills remain, and the amount of water received has not increased much over the past years, while the collection rate has increased. All but 50 customers have installed water meters, but there is a problem of metering error with the

old meters.

d) Improved bill collection rates

- The reason for the improved rate of collection is the suspension of water supply connections for customers with late payments and the installation of prepaid meters. When existing mechanical water meters fail, the policy is to install pre-paid meters for large non-paying customers.
- With regard to the suspension of the water supply, SIWA sends payment reminders over a three-month period, and if payment is still not made, the water supply is suspended.

e) Management issues

- The current CEO took charge of the office in 2023. His predecessor served for eight years, so turnover of top management is not frequent.
- The NRW team leader has been replaced three times in three years and the current leader is the fourth. Many of the replacements are due to retirements.
- The average staff retention period is six years. The turnover rate over the past three years has been significant. This is due to the Australian Mobility Partnership Program, which has resulted in many employees leaving to work in Australia.

f) Customer management issues

- Approximately 1,000 inquiries/complaints per month are received from customers. SIWA aims to respond to complaints and inquiries within three days, and although statistics are not strictly maintained, the average response time is about three days. Customers can submit inquiries and complaints via SNS, phone, visiting the Customer Office, email, or through an app developed by SIWA.
- Complaints vary from water disconnection, illegal connection, leak detection, lack of water pressure, water bill, and so on. The complaints are registered in the Enterprise Resource Planning (ERP) system called “Pronto”, and depending on the nature of the complaint, different departments, such as the NRW Team and the Water Supply Connection Team (for illegal connections), are requested to respond to the complaint.
- The most common complaint is reporting the occurrence of a leak, accounting for more than half (60%) of all complaints.
- Post-paid water meters are available in both pre-payment and post-payment systems. In the case of post-payment, a meter reader visits each house every month and issues a bill, hand-delivers the bill, or sends the bill to the customer's registered email address. Customers can pay at the counter, by bank transfer, or by mobile payment.
- Asset information is registered in Pronto, and depreciation and amortization for the year are automatically calculated when preparing financial statements. On the other hand, Pronto is not a system specialized for water business, and if there is a system optimized for water business, SIWA would like to consider migrating to it.
- A simple customer survey was conducted in FY2022 using college students. However, since the survey was not conducted rigorously, SIWA would like to conduct it while obtaining opinions from

experts with specialized knowledge in areas such as sampling and setting of question items.

g) Exclusion of SIWA from SOEs

- SIWA's exclusion from SOEs changes the appointment authority for board members. The Board members have changed significantly since SIWA's exclusion from SOEs. Originally, many members had business backgrounds, but now there are more government members, with the Commission of Police, the Commission of Land, MMERE, Ministry of Finance and Treasury (MFT), etc. at the undersecretary level, becoming board members. Accounting and other systems remain unchanged.
- While an SOE, it was required to pay dividends to the government when profits were generated, but since it is no longer an SOE, it is not obligated to do so. Although SIWA may use the profits for small-scale renewal investments, SIWA is not required to cover Capital Expenditure (CAPEX) through water revenue, and water tariffs are basically subject to approval by the Minister of MMERE.

(3) Reactions and views of utility executives on problem-solving approaches (Solutions)

a) Data of diagnostic analysis

- The customer satisfaction rate is the ratio of complaints and inquiries per 1,000 customers, and there is no equivalent to satisfaction rate.
- The reason for the decrease in water supply coverage is likely due to disconnection due to nonpayment. These unpaid customers are likely to be illegally connected because they have no other alternative water source.
- The installation of prepaid meters with the support of DFAT is a major contributor to the increase in water meter installation from 60% to 99% in 2022 and 2023. Illegal residents do not have prepaid meters and are unable to pay, resulting in illegal connections.
- When new water meters are installed, including replacements, prepaid meters are installed. However, illegal connections are occurring due to difficulties in payment.
- Regarding the financial statements, the reason for the large amount of Evaluation Surplus in 2022 is due to the revaluation of assets in the year. As a result of the revaluation, it was found that (1) there were many assets that were not registered in the asset register, and (2) due to inflation and other factors, the assessed value of assets was not the correct value, which was recorded as an extraordinary gain. Since depreciated assets were basically not subject to revaluation, the depreciated assets in terms of value were smaller than the actual aging of the facilities.

b) Reactions and views

- Basically, SIWA management agreed with the proposed analysis and solution.
- Regarding the employment of staff, there is a statement that accountability and transparency are unclear, but SIWA understands that this is not a particular problem and would like the statement to be deleted. (Research Team Supplement: Reason cited from government article when SIWA was excluded from SOE)

- Regarding the additional NRW reduction benefit calculation sheet, SIWA requested the original data as it is very interesting.

(4) Action plan

In consultation with the executives, the action plan was positioned as the creation of a document to take the first steps in the direction of the improvements shared and discussed during the field survey. In the long term it will benefit the utility. The Action Plan is as follows. However, it was difficult to follow up on the preparation of the documents through remote communication that required consultation, due to time constraints. Each of the contents was confirmed in person during the second field survey.

Table3-4 SIWA Action Plan

No.	Request	Received or not
1.	Develop a table of contents for a water management plan aimed at transforming the water utility into a self-supporting and customer-oriented water utility. This will include a Human Resource Capacity Development Plan and a NRW Management Plan, to be worked on in cooperation with all departments.	It was a time-consuming task.
2.	Improve the potential solutions (solutions) on the analysis sheet.	Received during the 2nd field survey
3.	Select KPIs (Key Performance Indicators) for the solution and set KPI targets.	Received during the 2nd field survey
4.	Fill the FY2023 portion of the NRW reduction benefit sheet.	Received during the 2nd field survey

(5) Executive awareness of problems and willingness to improve the organization

a) Biographies of Executives (CEO), etc.

The CEO is appointed by the Board of Directors and serves a three-year term. The former CEO had a technical background, and the current CEO also has a technical background. The current CEO previously held management positions at a water utility in Nauru, a power and water sector regulator in Vanuatu, and a power and water infrastructure company in Australia.

b) Executive awareness of problems and willingness to improve the organization

Immediately after assuming office in 2023, the CEO prepared “the SIWA Organizational Structure Review Report” in the first quarter of 2024, proposing a new organizational structure. At the same time, in July 2024, he prepared “the Five Year Corporate Strategic Plan 2024 to 2028”, which is a plan for organizational reform. At the end of June 2024, a Half-Yearly Report (1st January to 30th June 2024) was prepared. The CEO has analyzed the problems in detail and plans to reform the organization, and he is highly aware of the problems and eager to reform the organization. The CEO's key issues in the interview were as follows.

- The current CEO advocates a customer-centric approach. Customer service, increased water revenue, reduced NRW, and safety are key areas of focus; the 5-year strategic plan will also enhance customer service in line with the core functionality described in the SIWA Act. In order to promote customer centricity, it is important to conduct customer satisfaction surveys, and outside professional assistance is needed for this. Customer feedback is important for the improvement of

business operations.

- Created a dedicated communication team; conducted four stakeholder meetings per year.
- The CEO intends to strengthen asset management as 60% of the facilities are aging and need to be renewed in a planned manner. A team has been established for this purpose.
- SIWA'S organizational reforms are strengthening the following three areas of the SIWA Act's core mandate. In addition, a digital strategy is being developed with the World Bank that includes automation, data use and processing, and AI.
- Water tariff-related service (water shutoffs and communication with customers)
- Customer service (awareness campaigns on specific days, sending thank you messages to customers who make payments on time, developing SIWA app, enhancing stakeholder participation)
- Asset Management (creation of units, development of asset management policies, strategies and plans, etc. (Policies have already been approved by the CEO and are awaiting final Board approval). Strategy is 25% prepared. Will then lead to a pipeline renewal plan).
- For NRW management, SIWA has incorporated an asset management plan. This has been a very good platform for consultation with international organizations (DPs).

Overall, there was good teamwork. In the consultations, key senior officials confirmed their willingness to respond earnestly to the inquiry team's questions by assisting and cooperating with the CEO's instructions. In addition, each department in charge explained during the site visit. Through this, SIWA's staff efforts for improvement were confirmed. The CEO, whose term is three years, immediately prepared an organizational reform plan and guided the direction of customer orientation, public relations, and computerized financial management. Under this CEO, SIWA can be expected to progress in the future with enthusiastic staff carrying out its work.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	4 Immediately after assuming CEO's new position, the CEO has begun identifying issues and formulating strategies.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	4 Immediately after assuming CEO's position, the CEO set out a vision of focusing on customers and services, and is working to operate the company based on that vision.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	2 It is a national organization, and the CEO assesses the situation and responds accordingly.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	3 Immediately after assuming his position, he has prepared a semi-annual report and business strategy and is working on reforms. In particular, he aims to establish an asset management system for efficient facility improvement and maintenance.

(6) Comparison with desktop survey results

The desktop survey depended on local newspaper articles and websites of supervising ministries and agencies as additional resources, due to limited information on DPs activities. Therefore, many bottleneck factors were added during the field survey and also more detailed analyses were made on NRW. Initially, newspaper articles and information from the supervising authorities pointed to SIWA's management capacity and governance failures, but these were not identified as major bottlenecks in the field survey. Although the mid-term goals did not change significantly, the identified bottlenecks increased, so the solutions including activities to address the corresponding bottlenecks also increased.

a) Reduction and addition of bottlenecks

- Reduction
 - Status of staff management, organizational and administrative issues
- Addition
 - Unknown customer satisfaction
 - Increase in illegal connections due to strict enforcement of water supply shutoffs
 - High water tariff due to continuous rate increases
 - Lack of human resource capacity development
 - High turbidity problem of raw water during heavy rain
 - Possibility of cooperation and coordination activities with key stakeholders

b) Added Solutions

- Water tariffs are set low or adjusted considering affordability to pay.
- A training program has been established.
- Water resources are recovering.
- Strengthen coordination and cooperation with key stakeholders.

3.2.2.2. Second field survey

(1) Meeting counterpart

As with the first survey, the second survey was attended by the CEO and executives from all major departments in both the general briefing and the wrap-up meeting. In addition, this time, a technician from the NRW Management Division, who received training in NRW management at Manila Water Corporation in the Philippines, participated in the meeting.

(2) Challenges perceived by the destination

a) Removal from SOE

The composition of the Board of Directors has changed, but there is no operational impact. The reporting requirement to the MFT (Ministry of Finance) has been eliminated, which has reduced the workload.

b) NRW ratio

Illegal connections are increasing. Commercial losses in 2023 were 15% (25% of 60% NRW), rising to 27% in 2024. The physical loss decreased by that amount. SIWA believes this is a result of the implementation of leakage control measures within the DMA. 25 step tests were conducted in DMAs in 2024, which was the largest number ever.

c) NRW countermeasures

SOPs and manuals from JICA's technical project are being used. Activities within DMA are doing everything they can, including activities to cut DMA (customer surveys), MNF (minimum nightly flow), step testing, etc. The NRW management plan developed by the JICA's technical cooperation project is already outdated and needs to be updated. A Fact-Based NRW plan is needed. Resources are needed to reduce NRW, but they are insufficient. Staff is being sent to Manila Water to receive training on NRW management.

d) Renewal of pipelines

In order to reduce physical loss, renewal of old pipelines is necessary. After examining pipe age and leakage points, 80 km of pipelines were selected for renewal. 2 Million USD will be allocated for NRW with ADB support. 10 km of renewal is planned by ADB (bidding this year, construction in 18 months starting next year). SIWA plans to renew 5 km of pipelines annually.

e) Illegal connection

Non-physical losses have increased rapidly in recent years. It is necessary to verify data of customer disconnection, reconnection, and new connection. Currently, SIWA launched a scheme to combat illegal connections (SWATT: Solomon Water Anti-Theft Team). SIWA plans to file a lawsuit against violators in the future. This will serve as a wake-up call to other illegal connections. They are also trying to persuade illegal connections to change to legitimate connections.

f) Prepaid meter

SIWA lost customer confidence due to the installation of prepaid meters (2,000) 6 years ago. Currently SIWA plans to procure 800 of the latest prepaid meters from South Africa with support from the World Bank. After confirming this success, SIWA plans to expand (6,000) and request DPs' support. Many customers are in favor of installing prepaid meters. The unit price is USD 134. Priority for installation is disconnected customers. 70% of installation among commercial customers is the target.

g) Water tariff

A tariff review is needed but has not been conducted. SIWA plans to conduct it this fiscal year. A customer satisfaction survey needs to be conducted first considering the JICA Study Team's recommendation. A lifeline tariff needs to be established if water tariffs are to be set based on the ability to pay. This is the role of the government and there is government subsidy. SIWA needs to set water tariffs to continue operations. Repayment of DP loans also needs to be done by SIWA, but it is unclear if this is included in the current water tariff and needs to be confirmed in the tariff review. On the other hand, regarding prices, the price of bottled water is very high, but citizens are buying it.

h) Suspension of water supply

Water supply is suspended when the source water quality exceeds 20 NTU. In 2024, the total number of water supply suspension days is 27, calculated with consideration of the duration of the outages. Furthermore, the suspension times vary by region. Once the Kongulai Water Treatment Plant is completed, this issue will be resolved. Currently, the government is drafting a Water Resource Bill aimed at water source management. Construction of the Kongulai Water Treatment Plant has not yet begun, and a re-selection of contractors is necessary. Construction of the water treatment plant has not yet begun. The contractor needs to be re-selected.

i) **Efficient use of water resources**

To prepare for water supply interruptions, it is necessary to mix surface water and groundwater in each distribution zone. Currently, this mixing is only being carried out in one district (Kombito).

j) **Training system**

A training coordinator is currently being recruited. The staff turnover rate can be reduced through capacity building (including scholarships to universities), promotion, and implementation of a change management plan. However, it depends on the external employment conditions. DP projects hire staff members at high salaries.

(3) Reactions and views of utility executives on solutions and approaches

The diagnosis and solutions were explained, and basic agreement was obtained from SIWA regarding the contents.

a) **Bottleneck and current business cycle**

The bottleneck factors were checked by both parties. Additional major bottleneck was not found in the SIWA, but the difficulty of controlling water pressure in the water supply area with respect to NRW was added.

b) **Strategies and steps to resolve bottlenecks and put the company on a growth spiral**

- The following measures were added based on discussions with SIWA.
- Conduct water rate review
- Improved prepaid meter management
- Optimize the balance between surface water and groundwater production (lower electricity costs and fewer water supply interruptions)
- Improving operational efficiency with SCADA
- Increase in customers (result)

The participants also recognized the need for coordination and cooperation with other stakeholders.

c) **Discussion on target values**

Indicators and indicator values for improvement were discussed with SIWA and target values were set.

d) **SIWA Comments**

These diagnostics /solutions will be used as a basis for developing strategies and plans in the future. The CEO commented that the next step is to implement these solutions.

3.2.3. Details of discussions with other organizations

3.2.3.1. Government institutions

(1) MMERE

a) SIWA's exclusion from SOE

- The exclusion from the SOE is due to delays in the progress of DP supported projects and other projects. MMERE will also participate in the Project Management Unit (PMU) to facilitate project implementation. If there is an improvement in the progress of donor projects, there is a possibility that SIWA will be returned to the SOE.
- With the removal of SIWA from the SOE, the SOE Act will no longer apply and will only be in accordance with the SIWA Act.
- If the SOE Act is also applicable, the MFT and the MMERE will be the competent ministries, but if only the SIWA Act is applicable, only MMERE will be the competent ministry. The current board members are mostly representatives of the private sector (many are business people and no members understand technology), and MMERE's involvement is limited, but after the exclusion from the SOE, the Minister of MMERE will appoint the board members, so the Ministry's involvement will be relatively greater.
- Regarding government subsidies to SIWA, the MFT provides a certain amount of subsidy to all SOEs every year in the form of Community Service Obligation (CSO). Therefore, prior to its exclusion from SOEs, SIWA was also subsidized by the MFT. MMWRE also subsidizes certain projects in SIWA, with 20 million SBD already granted in 2023 and 42 million SBD to be granted in 2024. The former MFT grants will no longer be available once the SOE status expires.

b) Water tariff and financial independence

- It was recognized that water tariffs are very high, largely due to NRW and electricity costs. The government is considering intervening to lower the cost of electricity in some way.
- Water tariffs are revised by board members and approved by MMWRE. The process will not change significantly after SOE status is eliminated, but there may be some impact since MMWRE will have the authority to appoint board members.
- SIWA is free to set and implement the hiring and salaries of SIWA staff without the involvement of MMWRE.
- If the service is good (especially for high turbidity measures), customers are willing to pay the price.

c) Others

- Water Policy, which is the overall policy for the water sector, is under MMERE. SIWA is responsible only for water supply in urban areas. Rural Water Supply, Sanitation and Hygiene (RWASH), an agency under the Ministry of Health, is responsible for water supply in rural areas. The Ministry of Health is responsible for water supply in rural areas.
- Regarding water resource management, SIWA currently has authority as both operator and regulator, the latter of which is largely inoperative. Therefore, a Water Resource Bill will be

developed as a revision of the current River Water Act (which determines authority over the six rivers of Guadalcanal and was developed in 1962) and is currently being drafted. Currently, private well drilling companies are free to drill wells, but the new Bill will regulate the Right and License. The Water Resource Bill envisions the establishment of a new regulatory agency within/(directly under) MMERE.

3.2.3.2. Development partners

(1) DFAT

- DFAT provided financial and technical assistance to SIWA for more than 10 years until around 2020. Since then, DFAT has determined that SIWA has become somewhat self-sufficient, DFAT has only been providing ad hoc support such as COVID support for the last three years or so. However, the business situation has been declining.
- Currently, there is more support for sanitation and social infrastructure, such as rainwater management and hand washing in schools.
- Two projects that have not been realized but have been considered are (1) revisions to the SIWA Act, which took effect in 1992 (to give SIWA stronger authority since its authority is limited), and (2) water supply improvements for the Binah Harbor development, but neither of these projects has progressed.
- There is no strategy for support programs. DFAT is working on an ad hoc basis. Once the water treatment plant is completed, it may be necessary to improve water treatment plant management techniques.

(2) ADB

a) ADB's cooperation to SIWA

- The Urban Water Supply & Sanitation Sector Project (UWSSSP) is co-financed by ADB, the World Bank, and the EU (including some grants) and is constructing and upgrading facilities in four areas: Honiara, Tulagi, Auki, and Noro. The UWSSSP is constructing and upgrading facilities in Honiara, Tulagi, Auki and Noro.
- One of the components in Honiara is the construction and installation of a water treatment plant (rapid filtration water treatment plant), distribution reservoirs and pipelines in Kongulai. 15,000m³/day of water treatment plant in Kongulai is equivalent to 40% of Honiara's water demand. Therefore, SIWA and Solomon government agencies also consider it important. The project cost is USD 25 million.
- On the other hand, when SIWA tried to terminate the contract of the constructor because the quality of the constructed water purification plant did not meet the standard required by SIWA, the matter went to court.
- The UWSSP also includes projects related to NRW, including the replacement of 10 km of aging pipelines. Other projects include the installation of sewage pipes in the Panacena area of Honiara.
- On the advice of the World Bank and IMF, the national debt is managed not to exceed 35% of GDP;

currently 21%. The Ministry of Finance and Treasury (MFT) has also used the project budget to purchase debt to 9%. Solomon is a Yellow Status Country (Small Island development stage)).

b) Others

- All SOEs have become insolvent (2005 to 2008); SIWA was insolvent once in 2007, when the government assumed all of its debt.
- With regard to Solomon Power, it plays both operator and regulator roles, and governance such as rate regulation is ineffective. Therefore, there is a movement to establish a new regulator to control electricity tariff. SIWA is the largest electricity consumer. Solomon Telecom has a regulator.

3.3. Madagascar Electricity and Water Authority (JIRAMA)

3.3.1. Results of utility analysis

3.3.1.1. Results of analysis after desktop survey and field study

(1) Updated Indicators (financial part not disclosed)

Table3-5 Key Performance Indicators (related to water services) (JIRAMA)

KPI #	KPI	Data(2023)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (MGA)		-	-
2	Production capacity (m ³ /day)	403,654	-	↘
3	Production (m ³ /day)	392,220	-	↗
4	Utilization ratio of production capacity (%)	97	-	→
5	Continuity of Service (Hrs/day)	16	2	↘
6	Quality of water supplied (Compliance rate: %)	94	4	?
7	Water supply pressure (%)	65	-	↘
8	Leakage ratio (%)	-	-	-
	2.Increased customer base and satisfaction			
9	Population served	4,081,410	-	↗
10	Service coverage / Water coverage (%)	55.9	2	↘
11	Customer satisfaction (%)		NA	↘
12	Water sold (m ³ /day)	215,967	-	→
13	Water consumption per capita per day (L/ca/day) (Water sold/service population)	52.9	-	-
	3.Increased tariff revenue			
14	Turnover from sales (MGA)	74,086	-	↘
15	Collection ratio (%)	110	4	↗
16	NRW ratio (%)	45	1	→
17	Metering ratio (%)	100	4	→
18	Water tariff level (USD/6m ³)	74,086	-	↘
	4.Improved financial management			
19	Accounting system	General Accounting Plan 2005		-
20	Net income (MGA)			
21	EBITDA (MGA)			
22	EBITDA margin (%)			
23	EBITDA margin excl. deferred income (%)			
24	Total capital operating margin (%)			
25	Operating Profit Margin (%)			
26	Equity ratio (%)			
27	Fixed long term conformity rate (%)			
28	O&M cost coverage ratio excluding subsidies (%)			

KPI #	KPI	Data(2023)	Stage of growth	Trend
29	O&M cost coverage ratio (%)			
30	Unit cost of water supply (MGA /m ³) (Overall cost including DEP/Water sold)			
31	Supply price (MGA /m ³) (Turnover from sales/ Water sold)			
32	Subsidies (MGA)			
33	Development Partner grant support (MGA)			
34	The ratio of subsidies and DP support to turnover			
35	Number of staff per 1,000 connections			
	GDP per capita (USD)	506.2		
	Inflation rate (%)	9.87		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis (not disclosed)

The financial statements were obtained from JIRAMA in this study on condition of non-public disclosure. Therefore, no financial analysis is presented in this report.

(3) Summary of bottleneck analysis

(Internal Factors)

a) Financial difficulty

- JIRAMA's 2023 financial statements are still under preparation, and there are concerns regarding its financial health. The organization is not generating sufficient revenue to cover O&M costs for both electricity and water services. In fiscal year 2022, the O&M cost coverage ratio was 44% for the entire operation and 78% for the water business, resulting in negative shareholder equity and hindering internal investments.

b) Management challenges in both electricity and water

- JIRAMA's electricity and water services are closely interrelated and both face significant challenges that require improvement. Although technical staff are separated by service, the commercial department staff (responsible for customer-related tasks such as billing) and administrative staff (handling finance, human resources, etc.) are involved in both, making their separation complex. KPIs are used to manage regional offices, but financial capacity remains an ongoing challenge.

c) Lack of detail mid to long term recovery plan

- The restructuring plan for JIRAMA, formulated in 2024, lacks the details necessary to achieve mid-term cost recovery, and it is unclear how the 2028 targets will be met. Frequent organizational restructurings under the new CEO/DG have destabilized departments and delayed the preparation of financial statements. Clear mid- to long-term plans and organizational stability are essential for successful implementation.

d) Significant deficit in water supply capacity resulting in low coverage

- JIRAMA's production and distribution capacity is insufficient to meet the growing demand, resulting in a low water supply rate of 55.9% in 2023. Prolonged underinvestment in transmission and distribution pipelines has left many towns, especially during the dry season, facing water

shortages. The 2024 recovery plan calls for expanding production capacity by more than 150% to meet demand.

e) Continuously high NRW ratio

- JIRAMA has been implementing measures to address NRW, but these have not been effective, and the rate remains high in the 50% range. The main factors include illegal connections, leakage from aging pipelines, and failures of outdated water meters, among others.

f) Staffing shortages and organizational instability affecting customer satisfaction (need for personnel development)

- JIRAMA is facing a shortage of maintenance staff and inefficient operations. It often relies on temporary staff without proper qualifications, which results in inefficiencies and high turnover rates. Moreover, JIRAMA's frequent organizational restructurings have undermined departmental stability. Additionally, a customer satisfaction survey for water services conducted in Antananarivo in 2024 revealed a very low satisfaction rate of 44.4%, highlighting the urgent need for significant improvements and the implementation of a systematic training system.

(External factors)

g) No cost-recovery level tariff due to the absence of tariff revisions for many years

- The level of water tariff has remained at the non-cost recovery level. Since 2017, JIRAMA has been applying for an upward revision of water tariffs considering inflation rates and other factors. However, the approval authority, the Ministry of Water and Sanitation (MEAH), has not approved it. This has led to a deterioration of the financial situation.

h) Insufficient regulatory function and organizational capacity leading to low governance of the water sector

- The regulatory bodies, Water and Sanitation Regulatory Society (SOREA) and the National Water and Sanitation Authority (ANDEA), are not functioning, leading to concentrated authority in MEAH, causing governance confusion in Madagascar's water and sanitation sector. MEAH's budget execution is low, averaging 53% from 2015-2020, due to budget reshuffles and low absorption capacity, risking investment planning.

i) Inconsistent electric power supply

- Frequent power outages are a major cause of limited operation of pumping facilities at water treatment plants and pumping stations. This is a major challenge for the expansion of water supply services.

(4) Overall diagnostics of growth spiral (financial part is not disclosed)

JIRAMA has been in a difficult situation with sustainability of the operation. The production capacity, production and population served have increased gradually. There is almost no spare production capacity available and much behind the water demand, which results in difficulty in increasing service coverage

and continuity of services. The expansion of production capacity along with distribution capacity may be an urgent issue to improve the water supply service. NRW remains high, which affects water sales and exacerbates the financial conditions. The number of staff per 1000 connections is very low, seemingly indicating a very efficient workplace, but according to JIRAMA, maintenance and management are inefficient, which may be caused by a lack of human resources. Most financial indicators are negative and in a deteriorating trend. The overall growth spiral is not working well.

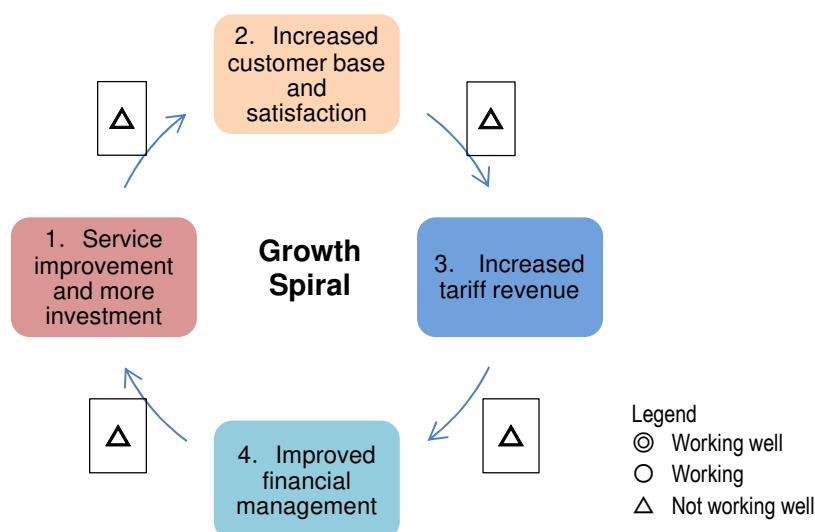


Figure 3-7 Growth Spiral Diagnostic Results (JIRAMA)

(5) Strategic analysis

1) Medium-term targets and recommendations

In the strategic analysis, based on JIRAMA's 2025 budget concept and analysis results, the mid-term goal necessary for JIRAMA to activate the growth spiral was set. Since it was not possible to confirm JIRAMA's mission and vision in this survey, higher-level goals were set based on the mid-term goal.

■ Mid-term goal: JIRAMA's turnaround is initiated by establishing a robust corporate management system to achieve financial stability and adequate service delivery, improving human resource capacity at the regional level and creating model branches that can be expanded nationwide to enhance overall water utility levels.

Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by low water tariff levels. Revenue from water sales is insufficient to cover even basic O&M costs or to fund investments in water supply infrastructure. These challenges prevent JIRAMA from achieving service improvements.

As an initial step, a comprehensive turnaround plan for water supply should be developed, with an initial focus on the capital city. The following actions should be prioritized:

- Establishing a robust corporate management system integrated with performance monitoring mechanisms.

- Enhancing operational efficiency by reducing NRW and optimizing O&M practices, supported by human resource capacity development.
- Transforming and strengthening customer-oriented service
- Adjusting water tariffs while simultaneously strengthening the capacity of regulatory bodies (SOREA and ANDEA), which currently appear to be underperforming. (external factor)
- Enhancing organizational capacity within MEAH to improve governance and project execution. (external factor)
- Developing and implementing capital investment projects to initiate the turnaround, with active support from development partners (DPs).

The turnaround plan should incorporate ongoing water facility projects by the World Bank and the EIB, along with their technical assistance, to achieve a collective impact in coordination with other DPs.

2) Steps to make growth spiral work

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram). By implementing each of these measures, it is possible to create a growth spiral in the form of implementing the reconstruction plan and introducing corporate management systems → improving operational efficiency and water services → increasing customer satisfaction and water supply coverage → increasing net profit → improving financial conditions (establishing model branches) → expanding model branches nationwide → improving water services across the country. By also implementing measures to address external factors, the growth spiral can be activated more effectively.

■ <Improve management and operation at the regional level and create a model branch>

1. Develop the implementation capacity of comprehensive turnaround plan for the water supply
2. Develop an effective corporate management system
3. Improve operation efficiency

■ <Extend a model to nationwide>

4. Turn around and establish a model branch
5. Use the model branch as the center to expand and enhance the level of water utilities across the country.

■ <Improve external factors>

6. Develop regional and national water supply master plan
7. Expand water supply facilities
- 8.1 Exercise regular water tariff adjustment in conjunction with the strengthening of regulatory bodies (SOREA and ANDEA)
- 8.2 Strengthen the capacity of the MEAH for increasing the execution rate of investment plans

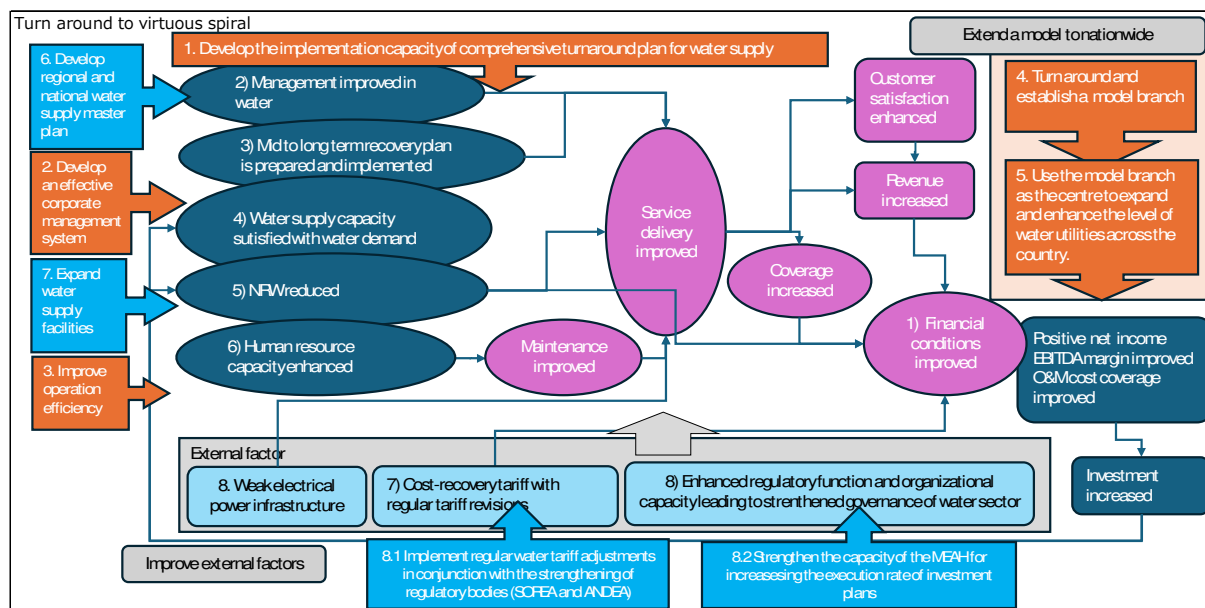


Figure 3-8 Growth Steps (JIRAMA)

3.3.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to activate JIRAMA's growth spiral are outlined below.

<Internal activities>

Outcome 1. A comprehensive turnaround plan for water supply is developed and implementation capacity is enhanced.

- 1-1 Assess the management capacity of JIRAMA for water supply
- 1-2 Formulate a turnaround/recovery plan for JIRAMA (infrastructure development and operation, improvement of operation and financial conditions, human resource development, customer-oriented service)
- 1-3 Enhance the implementation capacity of the turnaround plan

Outcome 2. An effective corporate management system is developed.

- 2-1 Develop the planning including setting KPIs with measure to achieve the KPI
- 2-2 Strengthen the branch office's financial and operational management system which enables KPI monitoring
- 2-3 Introduce a performance-based management system of branch offices with technical and financial KPIs

Outcome 3. An operational efficiency improvement plan, including NRW management, is formulated and implementation capacity is enhanced.

- 3-1 Assess existing operational efficiencies

- 3-2 Formulate/update NRW management plan based on the previous World Bank project
- 3-3 Implement NRW management plan
- 3-4 "Replace aging transmission and distribution pipelines "

Outcome 4. Human resource management and capacity development are enhanced.

- 4-1 Efficient human resources plan is developed
- 4-2 KPI and performance management of human resources is implemented
- 4-3 Training system with meritocracy is implemented

<External activities (with the ministry)>

Outcome 5. Develop regional and national water supply master plan

- 5-1 Develop a master plan for the major cities/areas
- 5-2 Develop a financing strategy to mobilize funds for major investment

Outcome 6. Water supply facilities are expanded.

- 6-1 Review existing plans and examine other donors' activities for water supply facilities.
- 6-2 Conduct surveys for the development of new water resources and construction of facilities.
- 6-3 Construct new water supply facilities.

Outcome 7. Water tariffs are adjusted, and the implementation of investment plans is improved (SOREA, ANDEA and MEAH)

- 7-1 Analyze detail bottlenecks to hinder tariff rate adjustment and execution of investment plans
- 7-2 Set up required institutions and guidelines for tariff rate adjustment, ensuring regulatory bodies (SOREA and ANDEA) are strengthened.
- 7-3 Exercise tariff rate adjustment
- 7-4 Improve the organizational capacity within MEAH to ensure better governance and effective execution of investment plans.

(2) Improvement scenarios

The activities for Outcome 1 aim to strengthen the capacity for formulating and implementing the reconstruction plan. The activities for Outcome 2 focus on developing effective corporate management systems, and the activities for Outcome 3 aim to improve operational efficiency. Through Outcomes 1, 2, and 3, model branches will be established, and by expanding these model branches nationwide, the water services across the country will be improved. By implementing activities to address external factors, the expansion of water facility capacity, strengthening of water sector governance, and revision of water tariffs will be achieved, aiming to meet the mid-term goal. The improvement scenario for JIRAMA, based on the outcomes and activities, is as follows.

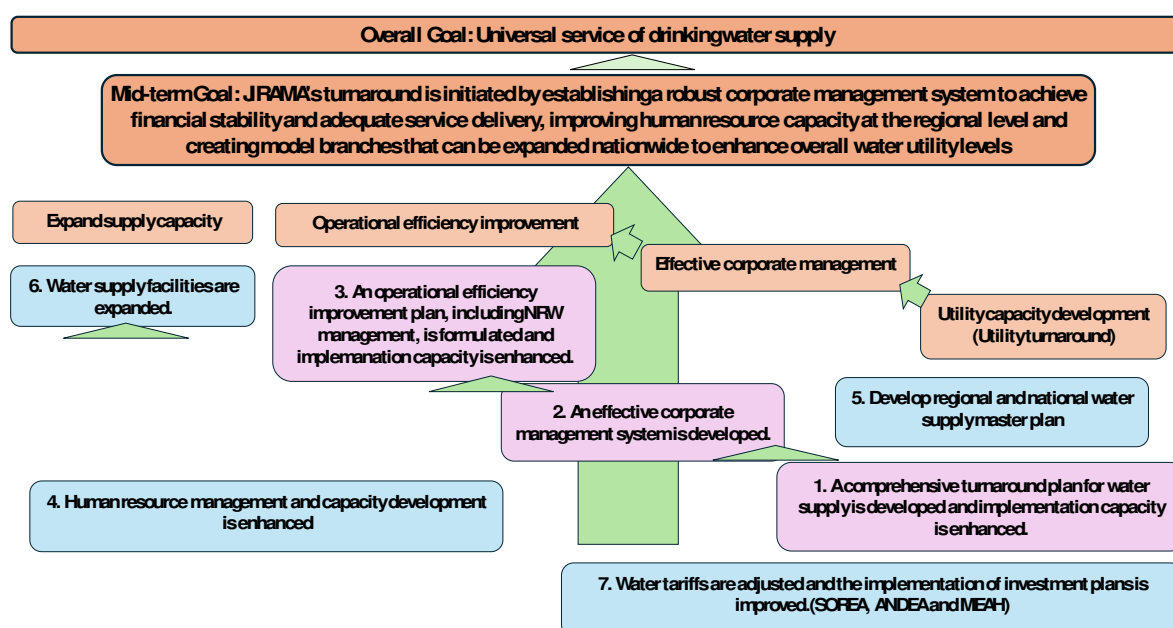


Figure 3-9 Improvement Scenarios (JIRAMA)

3.3.2. Details of discussions with utility

3.3.2.1. Results of the first online consultation

Due to the elections in December 2024, the first field survey was changed to two virtual (online) meetings.

(1) Meeting counterparts

The first and second discussions were chaired by the planning coordinator of the water sector, and included discussions with the coordinators of the customer management and water supply sectors, etc. The Chief Executive Officer (CEO) did not participate, and the discussion with the CEO was scheduled during the field trip.

(2) Comments on the analysis results and recognized challenges by utility

a) Lack of funds for infrastructure investment

Although JIRAMA has received support from the World Bank and the EU through projects such as PAEEP² and Water III, this is not sufficient to meet JIRAMA's needs, and more funds are needed to implement specific activities such as increasing production toward 2035.

b) Water tariff setting and water supply regulatory agencies

Although a revised proposal was prepared to request an increase in water tariff to cover production costs, even after the revised proposal was submitted to the Ministry of Water and Sanitation (MEAH), the decision on water tariff has been delayed. It depends not only on MEAH but is also considered a political decision by the President of Madagascar in light of the domestic situation in Madagascar. The

² Madagascar National Water Project

background is that no regulatory body for water supply has been established.

(3) Reactions and views of utility executives on problem-solving approaches (solutions)

The poor internet connection on the JIRAMA side for the virtual meeting made detailed discussions difficult. Thus, the discussions on solutions took place during the field survey,

(4) Action plan

The action was to share relevant KPI documents and documents that show the details of the concession contract.

(5) Executive awareness of problems and willingness to improve the organization

It was confirmed that executive awareness of challenges and expectations for cooperation through this survey was high, despite the difficulty in online discussion.

(6) Comparison with desktop survey results

As noted above, the desktop survey did not collect sufficient data, so the consultant team requested that the results of the analysis be reviewed, and that additional data be provided.

3.3.2.2. Results of the first field survey

(1) Meeting counterpart

Interviews were held with the CEO, the Chief Financial Officer (CFO), the water operations coordinator, the water distribution chief, the water project and planning coordinator, the customer management department representative, and the customer center director.

(2) Challenges perceived by JIRAMA

a) Medium- to long-term planning

- While the Ministry of Water and Sanitation prepares overall plans for the water sector, it is an issue that JIRAMA's medium- to long-term plan has not existed until now.
- With the support of the World Bank, it is envisioned that a draft of the Management Improvement Plan (Plan de Redressement Eau Jirama) will be prepared in 2024 and reviewed every 6 months going forward. However, the first draft is still in the process of being presented to the CEO in February 2025 and has not yet been approved by the Board of Directors of JIRAMA.

b) Increased investment in water infrastructure

- Lack of Investment for water infrastructure is a challenge. Funds for investment come from DPs. JIRAMA used to invest its internal funds for developing infrastructure but is not able to do so now.

c) High NRW ratio

- There is no strategy for NRW, but the master plan supported by the World Bank project includes

the replacement of water pipes in Antananarivo.

- Aging infrastructure (water pipes are 50 years old and meters are aging) is causing breakdowns.
- Destruction or manipulation of meters by customers may prevent proper meter readings. Training for meter readers is needed to improve the quality of meter reading as well.

d) Increase in the level of water tariff

- The fact that the water tariff is not at a level that allows for cost recovery has been identified as a major problem. Since the 2017 revision, an application for another water tariff revision in 2024 has not been approved, due to Madagascar's economic situation.

e) Improvement of staffing efficiency and training

- Personnel decreased from 5,763 in 2018 to 4,809 in 2024. This reduction is due to budget constraints that have prevented the hiring of replacements for retired personnel.
- It is recommended that the staffing in the administration department be reduced and that this staffing be reallocated to the under-resourced technical department (Direction technique) for optimization.
- Until 2021, there was a performance system in which each personnel set and managed KPIs. It is recommended that the CEO re-apply this system.
- Lack of training and human resource development system.
- Although there is a training center in Antananarivo on water supply services, it is dilapidated and unusable. Thus, it is necessary to rehabilitate it.
- In particular, many engineers are reaching the age of retirement (60) and there is an urgent need to train replacements. Some of the engineers are concurrently working for both water and electric power. Technology needs to be transferred to the next generation.

f) Strengthening of staffing and management of local departments

- In 2024, the regional organizational structure was changed. The technical and commercial divisions of the headquarters have the role of supporting and managing the 25 regions.
- KPIs for local departments are set and managed, but there are challenges.

g) Delay in procurement of materials and equipment

- Delays in procurement of materials and equipment have hampered measures to deal with leaks and other problems.
- This has resulted in the customer satisfaction level declining to as low as 45% in the most recent survey in Antananarivo in 2024.

h) Strengthening of financial management and accelerate the preparation of financial reports

- Centralized control needs to be strengthened.
- While information on electricity and water production is reported monthly, financial information is not included in such reports.
- The management accounts exist for the management and analysis of the finances of each regional department. Each region has a finance officer. It is envisioned that it will be managed more centrally

and a focal point will be placed in the regional office in the future.

- The 2023 financial report is still in the process of being finalized with an external private auditing firm as of January 2025, when the field survey was conducted. Internal control issues such as changes in the management structure and the lack of reporting from each region have contributed to this delay, making it challenging to assess the current situation accurately.
- While annual reports are being prepared by each region currently, in the future the goal is to prepare the monthly report.

i) **Strengthening of asset management**

- Sale and decommissioning of assets do not proceed because ministerial approval is required for the sale.
- Although there is an asset ledger, the assets are not tagged. The year the asset was purchased is registered. Assets need to be verified and evaluated. In response, the World Bank is assisting with asset verification.

j) **Necessity of separating the power and water sectors**

- The need for separation of electricity and water divisions was not perceived, as the commercial divisions were managed in an integrated manner for the two divisions. In addition, JIRAMA's water division does not make payments to the electricity division for electricity costs, and JIRAMA's electricity division does not pay a part of its fuel costs, and this has supported JIRAMA's operations financially even though it has been continuously in red.
- The electricity service and water service are integrated and require management improvement and reform rather than accounting separation.

(3) Reactions and views of utility executives on solutions and approaches

The CEO agreed with the major points stated in the solution, which is that the level of water tariffs is an issue, although the increase in supply capacity, NRW measures, and the number of personnel in the technical department of the water utility should be increased. On the other hand, with regard to the perspective of separating the electricity service and water services for better management, the advantages of operating them as a single entity were also explained.

(4) Action plan

In updating the diagnostic report, the following materials were shared as actions. Although document collection would not have progressed without prompting, The JICA Study Team were largely able to collect the necessary materials. The JICA Study Team also sensed the executives' strong determination to improve the situation within their respective organizations through data collection

Table3-6 Action Plan (JIRAMA)

No.	Materials	Received or not
1	Annual Report for the Region of ATINANA 2024 (2023)	Received
2	Monthly Report on Water Operations of JIRAMA (December 2024)	

No.	Materials	Received or not
3	Quality of Water Supplied (Compliance Rate: %) for 2020, 2022	Received
4	Number of Connections for 2020, 2021, 2022, 2023	Received
5	Number of People per 1000 Connections	
6	List of 25 Regions (Sectors)	Received
8	Sectoral Water Plan at the Ministry Level	
9	List of Age of Receivables for the Past 5 Years	Received
10	Part of the Annual Budget on KPIs	
11	Distribution of Staff for Each Coordination and Region (All Divisions)	
12	Average Age of Staff	Received
13	Regularizing and renewing the concession contract for the drinking water supply centers of the Jiro sy Rano Malagasy Company	Received
14	Master plan development drinking water supply for the greater Antananarivo area	Received

(5) Executive awareness of problems and willingness to improve the organization

Both the CEO and CFO were appointed in 2024 following their nomination by the World Bank. They bring extensive international experience and have objectively recognized that JIRAMA faces more challenges compared to water utilities in other countries. They are aware of the issues and are keen to implement improvements.

Interviews with director-level staff at JIRAMA confirmed this recognition of challenges. While some areas such as interdepartmental personnel allocation have advanced in their analysis and development of specific countermeasures, others have not progressed as much. Overall, however, there is a clear commitment to addressing these issues through the formulation of a business improvement plan.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	4 The CEO, CFO and other senior executives are analyzing the issues in a turnaround plan.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	4 The company is aiming for improvement through its business restructuring plan.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	3 The CEO and CFO were appointed through nomination by the World Bank, so a certain degree of independence can be expected.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	4 Business improvement in progress

(6) Comparison with desktop survey results

- Carrying out JIRAMA's diagnostic analysis and preparing the solution report were more difficult than for other utilities because of the limited publicly available data, answers to the questionnaires, and shared materials in the desktop survey. Therefore, new information obtained during the field survey led to a deeper analysis and diagnostic report that was more in line with the actual conditions.

- With regard to the bottlenecks, especially since there was limited information on the actual status of integrated management of the electricity and water divisions, new information was obtained during the field survey, which indicated that integrated cash management was the reason for the cash flow, and that the respective businesses needed to be improved.
- Furthermore, with regard to the management of the regional departments, it was confirmed that while the technical departments report monthly, the financial reports are prepared annually (presumably because major procurement and payments are handled by the headquarters). It was learned that the financial reports for FY2023 were still being prepared as of January 2025.
- During the field survey it was also observed that there is a slight discrepancy between JIRAMA and the MEAH regarding the authority to take charge of the preparation of the Master Plan.

3.3.3. Details of discussions with other organizations

3.3.3.1. Government institutions

Interviews were conducted with the acting director of the Water Supply Division of the Ministry of Water and Sanitation (MEAH). The first interview was conducted online, and the second interview was conducted during the field survey. The main comments are as follows.

a) Overall Survey

- This study comes at a very good time, and we are hopeful, as Madagascar's water supply is in a serious condition, and we are looking for a sustainable solution.

b) Role of the MEAH and other regulatory agencies

- The MEAH plays a primary role and is responsible for policy formation; although there were changes in the composition of the MEAH in August 2024, its role remains the same
- ANDEA manages upstream sectors such as water resources management and water quality control.
- Currently, the regulation of water tariff management is handled by the MEAH. However, in the future, the SOREA is expected to take over responsibilities, including formulating the government's basic policies and managing water tariffs. Its functions are still being finalized, and it is scheduled to become operational in 2025 under the name OREA. With a budget allocated for its launch, recruitment for staff has already begun. OREA will regulate water tariffs not only for areas served by JIRAMA but also for private water service providers in regions where JIRAMA does not operate.
- There is no subsidy from the government for JIRAMA's water service for its operations. On the other hand, the government supports JIRAMA through the Ministry of Energy and Hydrocarbons. Without electricity, JIRAMA would not be able to supply water, so JIRAMA's first priority is the electricity business, with the water business taking a back seat.

c) Revision of water tariff

- Water tariffs are currently low relative to costs. Therefore, although a two- to threefold increase is necessary, implementing such an increase would be challenging. Another problem is that the tariff structure is the same for various regions even though the costs vary from region to region.

d) Challenges of Concession Contracts

- There is no KPI management in the concession contract.
- There is no segregation of funds between the water and power sectors.
- Repayment is made by the government in the case of the World Bank/EIB.
- JIRAMA can also enter contracts with private companies and has signed purchase agreements with two power suppliers.
- Although JIRAMA, as a state-owned enterprise, bears social responsibilities, under the concession agreement it is allowed to operate freely within its designated scope while still being required to pursue profitability as a company.

e) Long-term planning for the water sector

- A strategy document for the water sector was previously drafted but not finalized due to the need for coordination with other ministries. However, it is newly drafted and together with the new Code water is being prepared for approval by the National Assembly.

3.3.3.2. Development partners

(1) World Bank

The first meeting with the World Bank was conducted online and the second meeting was held on-site.

1) First Online Meeting

a) WB Madagascar

- WB Madagascar will support JIRAMA through the investment project PAAEP with a total of US\$220 million, US\$30 million for the MEAH and US\$190 million for JIRAMA to invest in infrastructure and institutional development in seven cities, with the capital, Antananarivo, at the center. The bidding process has already begun, and it is expected that contracts will be signed soon to begin activities for water purification production and supply.
- JIRAMA is currently conducting a survey of cities other than the seven targeted for this project and JIRAMA expects that the outcomes of the survey will lead to future projects.
- JIRAMA is financing a hydraulic Master Plan for the production of clean water for Antananarivo and is supporting it in terms of studies and financing. JIRAMA is also financing a Master Plan for two other cities (Tulear and Fort Dauphin).
- The MEAH is currently implementing a project in southern Madagascar (Tulear and Fort Dauphin), and it is expected to complement this activity in the large cities under JIRAMA's jurisdiction through PAAEP.
- For the water sector, WB plans to finance a pilot project to upgrade from conventional meters to prepaid meters.
- The Turnaround strategy does not provide support for specific activities. WB can provide support based on JIRAMA's performance if JIRAMA or the MEAH, under the PAAEP's budget, may narrow down their priorities and make requests JIRAMA needs to improve its operational performance.

- Antananarivo is undergoing urgent assistance due to lack of water production capacity; the World Bank will provide additional assistance once JIRAMA's performance improves and clean water production increases in the coming months.
- The World Bank has not had many discussions with JIRAMA regarding water tariffs. Revision of water tariff depends on political decisions, and time is needed.

b) JIRAMA

- Several years ago JIRAMA developed a restructuring plan. A new DG pursued specific water supply performance improvements, but various personnel disruptions have since prevented the implementation of the improvement plan based on performance indicators.
- JIRAMA needs to invest a large amount of money to decentralize management to the regions, and it must consider how to proceed efficiently by setting KPIs.

c) JIRAMA's Jurisdiction of Business

- JIRAMA has jurisdiction over 57 cities, but many of the cities are essentially under the jurisdiction of the MEAH. In the future, the World Bank hopes that the MEAH will transfer jurisdiction to JIRAMA. In that case, the private sector might be involved; JIRAMA has outsourced some operations to the private sector.

d) JICA Support

- The World Bank welcomes JICA's future support of JIRAMA through investment and technical cooperation. The World Bank provides support through PAAEP and other means, including in the water supply sector, which will result in huge investments by 2030.
- The World Bank is already providing assistance for the improvement of the operational efficiencies, including NRW. A study on JIRAMA's water tariff was done 4-5 years ago and will be updated in the future.

2) Second meeting (local consultation)

a) Division of roles and responsibilities between the MEAH and JIRAMA

- There is some ambiguity in the jurisdiction of the MEAH and JIRAMA. However, the preparation of Master Plan is essentially the responsibility of the MEAH. JIRAMA is involved in part because it is related to implementation. For example, some water supply areas/facilities are not related to JIRAMA.
- The role is described in "Decree d'application de code de l'eau. 2003 - 193".
- Therefore, in the Bank's projects, Project Implementation Unit (PIU) has been established in both the MEAH and in JIRAMA. The PIU at the MEAH will monitor the project.

b) Status of master plan preparation

- Master plan for Antananarivo is almost completed but waiting for the study part on groundwater. The final report is expected in July 2025. Based on this, a decision will be made with support by the World Bank. The amount of support is 24million USD.

- For Tuléar and Fort Dauphin, the other World Bank-supported projects, a TOR for consultants is being prepared. It will require another 6 months to procure the consultant.
 - The northern part, Antsirannana, Mahajanga, will be surveyed at a similar technical level, although it will not be called a Master Plan. Therefore, the northern part of the country also does not require Master Plan support.
 - The Master Plan study has 2042 as the target year.
 - The World Bank is supporting a Master Plan for the South.
- c) JIRAMA's project implementation capacity
- For World Bank projects, such as construction projects, JIRAMA's implementation capacity is supported because it hires engineers and procurement consultants.
 - A performance plan is being drafted to monitor the progress of project implementation by JIRAMA.
 - Lack of coordination between departments within JIRAMA is an issue.
 - However, because of JIRAMA's track record of often delaying payments, suppliers, including consultants, have been reluctant to accept contracts from JIRAMA. As a result, there are cases where procurement is delayed.
- d) Ability to prepare financial reports
- The audited 2022 financial statements were received in October 2024. This is very late and problematic.
- e) Transfer of authority of JIRAMA to the regions
- Since it is centralized, it is also necessary to decentralize authority to the regions. The World Bank is not in support of this.

(2) European Investment Bank (EIB)

An online interview with EIB representative.

a) EIB Madagascar

- The water supply sector in Madagascar has not seen major investments for the last 20 years, but with significant population growth, the need for investment has recently been discussed.
- The EU/EIB is moving forward with JIRAMA Water III (JW3), which was signed in 2020 and construction is scheduled to begin in 2025. Project details have been adjusted from the original.
- Last year, a study was conducted in Toamasina with an approval of 24 million euros. A project for a city in Madagascar following that study is currently under consideration and will be concluded by the end of this year.
- EIB supports Toamasina because it is a major city in Madagascar and we have conducted surveys in the past.
- JIRAMA's Master Plan does not even exist for major cities. Under these circumstances, the EU decided to implement an emergency project for water supply and distribution.
- The World Bank is financing a master plan covering Antananarivo, while the EIB is considering financing a master plan covering Toamasina.

- The Bank financed JIRAMA's study on water tariff in 2019. The World Bank is currently reviewing proposals to implement the proposal for said study.
- For the MEAH, the project provides technical assistance for the development of a water code, preparation of a manual for the operation of water supply services, the establishment of an institutional framework for the sanitation sector, flood and cyclone countermeasures, and wastewater treatment. Climate change and sanitation issues are important, but are not adequately addressed.
- EIB mainly provides support to the electricity sector in human resource development and governance. EIB provides support for political dialogue and councils of administration, including the World Bank, the IMF, and the AfDB.

b) JIRAMA

- JIRAMA has no long-term plan and struggles to address day-to-day issues. It also has governance challenges.
- JIRAMA has capable staff, but capacity development support has not been considered. The challenges facing JIRAMA lie in staffing levels and financial resources. Consequently, it is understood that they are seeking assistance in project management.
- The financial management of the electricity division and water division are integrated. Since the electricity division accounts for 80% of revenues, improvements in the water division are not expected to be effective for the improvement of JIRAMA as a whole. The World Bank is willing to finance a study to separate the management accounts.
- JIRAMA has drafted a restructuring plan and proposes to double the water tariff. Currently, the tariff for public water fountains (taps) managed by JIRAMA is higher than water rates.
- The plan for improving water utility performance has not yet been approved.

3.4. Uganda National Water and Sewerage Corporation (NWSC)

3.4.1. Results of utility analysis

3.4.1.1. Results of analysis after desktop survey and field study

(1) Updated Indicators

Table3-7 Key Performance Indicators (NWSC)

KPI #	KPI	Data(FY2022/23)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (UGX)	21,031,911	-	→
2	Production capacity (m ³ /day)	756,325	-	↗
3	Production (m ³ /day)	468,659	-	↗
4	Utilization ratio of production capacity (%)	61.97	-	-
5	Continuity of service (Hrs/day)	As the distance from Kampala City increases, the water pressure decreases.	NA	↗
6	Quality of water supplied (Compliance rate: %)	98.5	4	→

Data Collection Survey on Through Management Improvement Support Based on Cluster Strategy
for Supporting the Growth of Water Utilities (Final Report)

KPI #	KPI	Data(FY2022/23)	Stage of growth	Trend
7	Water supply pressure	-	-	-
8	Leakage ratio (%)	-	-	-
	2.Increased customer base and satisfaction			
9	The number of connections / Population served	892,099	-	↗
10	Service coverage / Water coverage (%)	84.0	3	→
11	Customer satisfaction (%)	86	3	→
12	Water sold (m ³ /day)	288,096	-	↗
13	Water consumption per capita per day (L/ca/day)	322.9	-	→
	3.Increased tariff revenue			
14	Turnover from sales (UGX)	550,000,000	-	↗
15	Collection ratio (%)	91	3	↘
16	NRW ratio (%)	34.9	2	→
17	Metering ratio (%)	NA (100% in 2021/22)	-	→
18	Water tariff level (USD/6m ³)	6.84	-	-
	4.Improved financial management			
19	Accounting system	corporate accounting	3	→
20	Net income (UGX)	40,787,210	-	↗
21	EBITDA (UGX)	131,007,796	-	↗
22	EBITDA margin (%)	28.0	2	→
23	EBITDA margin excl. deferred income (%)	11.0	2	↗
24	Total capital operating margin (%)	3.0	-	→
25	Operating Profit Margin (%)	3.8	2	↗
26	Equity ratio (%)	33.1	2	↘
27	Fixed long term conformity rate (%)	90.9	3	↘
28	O&M cost coverage ratio excluding subsidies (%)	112	2	↗
29	O&M cost coverage ratio (%)	131	3	↗
30	Unit cost of water supply (UGX /m ³) (Overall cost including DEP/Water sold)	4,924	-	↗
31	Supply price (UGX /m ³) (Turnover from sales/ Water sold)	5,230	-	→
32	Subsidies (UGX)	24,392,550	-	↘
33	Development Partner grant support (UGX)	55,369,006	-	↗
34	The ratio of subsidies and DP support to turnover	10.1	-	→
35	Number of staff per 1,000 connections	5	3	→
	GDP per capita (USD)	1,002.3		
	Inflation rate (%)	5.4		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis (FS Analysis)

1) Summary

- The O&M cost coverage ratio is 130%, which is almost stable from FY2019/2020. The O&M cost coverage ratio excluding subsidies has improved from only 105% in FY2020/2021 to 112% in FY 2023/2024. However, this low O&M coverage ratio excluding subsidies indicates that NWSC cannot independently fund infrastructure investments with its internal resources, and that such investments are being financed by government and DP subsidies.
- Compared to the previous year, the revenues increased by 14%. The expenses (excluding depreciation) increased by 15% due to an increase in employee benefit expenses and administrative costs.
- The depreciation in FY 2023/2024 increased only by 2% because of the lack of large investments completion.
- While EBITDA recorded steady growth for the last 4 years, EBITDA margin has been around 23% to 28% for the same period.
- Regarding the O&M expenses, the personnel costs comprise 44%, which is a very high proportion.

The electricity expense accounts for 17% of the O&M cost.

- Given that the sewage system development will also proceed in the future, it is becoming necessary to take into consideration the revenues and expenses in the sewage business.

2) Positive

- The EBITDA has been increasing steadily.
- The capital expenditures are higher than EBITDA, indicating a high level of capital investment.
- The company's financial health is stable, with an equity ratio of more than 30%.

3) Negative

- The operating cost coverage ratio excluding subsidies is low at 112%. This needs to be improved.
- The subsidies account for more than 50% of the balance sheet, indicating a high dependence on subsidies.
- Accounts receivable turnover days were 163 days for both the 2020/2021 and 2021/2022 fiscal years below 200 days. However, this figure deteriorated significantly to 313 days in the 2022/2023 fiscal year, and although it improved to 278 days in the 2023/2024 fiscal year, it still remains at a high level. This indicates that water tariff collection has not kept pace with the expansion of services.

(3) Summary of bottleneck analysis

(Internal factors)

a) Outpaced development of distribution infrastructure according to rapid population growth and urbanization

- The commissioning of a new water treatment plant at Katosi in 2021 has helped mitigate the growing water demand in the Greater Kampala Metropolitan Area (GKMA). However, the region continues to face challenges related to bulk transmission, storage, and distribution infrastructure, which are necessary to fully leverage the increased water production capacity. As a result, despite a 36% surplus in water production, service coverage has remained stagnant.

b) High NRW ratio

- In 2021/22, the leakage ratio (physical losses) and commercial losses were 18.4% and 17.0%, respectively, accounting for a total NRW of 35.4%. In Kampala, which accounts for 45% of NWSC's total connections, the NRW ratio stood at 40.4% as of March 2024, exceeding the NWSC average. The breakdown of NRW includes unbilled authorized consumption (8%), commercial losses (21%)—comprising unauthorized or illegal consumption (10.5%) and metering inaccuracies (10.5%)—and physical losses (16.4%). The high levels of both commercial and physical losses have a significant negative impact on financial capacity, increasing costs while reducing revenue.

c) High operational costs

- The O&M cost coverage ratio, excluding subsidies, grants, and depreciation, stands at 112%, which remains insufficient for strengthening self-funding capacity. High NRW, electricity costs, and staff expenses contribute to the overall high operational costs. Water tariffs are indexed to inflation and

other factors. Compared internationally, NWSC's tariff levels are relatively high compared with other utilities in this study.

d) Limited advanced distribution management

- The limited advanced distribution management in addition to aged distribution networks in Kampala hinders service reliability in the part of the GKMA area.

e) Future challenge of investment

- Based on the above, the insufficient self-funding capacity prevents NWSC from covering major investment costs, posing a future challenge. The difficulty in self-financing future investments results in continued reliance on Development Partners (DPs) for financial support.

(External factors)

f) Rapid urbanization and population growth

- The GKMA (Greater Kampala Metropolitan Area) has witnessed rapid urbanization and population growth, rising from a population of 2.4 million in 2014 to a population of more than 4 million now. Increasing water demand outpaces infrastructure capacity and expansion of service areas, leading to service gaps.

g) Government policy for infrastructure provision by the government

- Government policy indicates that infrastructure provision is the responsibility of the government. Government subsidies, as well as grants and loans from development partners, are recorded as deferred income from the government and are not reflected in water tariffs. The heavy reliance on deferred income for infrastructure investment raises concerns about long-term financial sustainability.

(4) Overall diagnostics of growth spiral

Improvements in water production capacity and increased production volumes have enhanced service delivery, including improved service continuity, resulting in a higher population served and increased sales. Nonetheless the service coverage ratio has not increased but remained constant, but this is due to a rapid increase in population in the GKMA. There remains a 36% surplus in water production capacity, and both production and sales volumes are expected to grow in the coming years. To achieve this, it is anticipated that expanding last-mile connections through the development of water distribution pipelines and related infrastructure will be essential.

In terms of costs, while sales increased by 14% compared to the previous fiscal year (2022/2023), O&M costs rose at the same rate, highlighting the need for more efficient operations. Additionally, the O&M cost coverage ratio, excluding subsidies and grants (deferred income), stands at only 112%. This insufficient O&M coverage ratio is partially attributed to the high NRW ratio, particularly in Kampala, where it exceeds 40% and the water tariff, which does not need to cover investment capital expenditure.

Due to the insufficient O&M cost coverage ratio excluding deferred income, it is currently challenging

for NWSC to finance major capital investments in the future. As a result, while assuming continued support from the government and development partners for facility development, it is desirable for NWSC to gradually strengthen its financial capacity to enable major investments using internal funds and borrowings by itself in the future.

While the growth spiral from element 1 to 3 is functioning, the primary bottleneck is the high NRW ratio in Kampala. The spiral from element 4 back to 1 is currently operating based on subsidies and non-reimbursable funds. Ideally, in the future, it is recommended that this spiral element be driven primarily by internal funds.

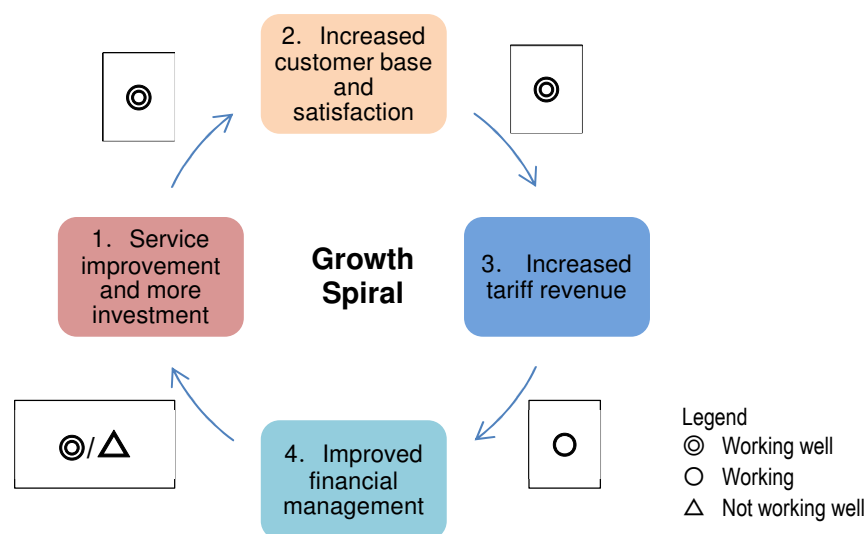


Figure 3-10 Growth Spiral Diagnostic Results (NWSC)

(5) Strategic analysis

In the strategic analysis, higher-level goals that encompass NWSC's mission and vision were created. Based on these higher-level goals and considering plans such as NWSC's Corporate Plan 2024-2027, mid-term goals necessary for NWSC to activate the growth spiral were set.

- Mid-term goal: " Internal funding and fundraising capacity is strengthened by enhancing operational efficiency including reducing NRW, optimizing costs, and appropriately adjusting water tariff rates to achieve commercially and financially sustainable management in the mid-term"

Current water rate levels are inadequate to cover both maintenance and investment costs, and the following are recommended:

- Large-scale facility expansions and rehabilitation projects may continue to depend on external funding, such as subsidies, grants, and concessional loans from development partners (DPs).
- Smaller-scale investments, such as the rapid implementation of water connections to expand service coverage, should be financed through internal funds.
- The NRW ratio in Kampala is the highest among all regions and must be addressed to improve NWSC's financial sustainability. The improvement measures implemented in Kampala will serve as a model for other regions.

- In parallel, efforts to reduce NRW, optimize costs, expand the served population, and review and adjust tariffs should be pursued to strengthen internal funding capacity and enhance fundraising potential.

1) Growth steps

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram). By implementing each of these measures, it is possible to create a growth spiral in the form of reducing NRW → reducing maintenance costs → optimizing water tariffs → securing sufficient net profit → developing infrastructure with self-financing → expanding the water supply area.

1. Implement NRW management strategy and plan
 - 1.1 Improve meter management measures
 - 1.2 Implement illegal connection measures
 - 1.3. Enhance the organizational capacity of NRW management
 2. Renew aged pipes
 2. Introduce advanced distribution management
 3. Optimize costs
 4. Review and adjust the tariffs
 5. Development of infrastructure by own funding and initiatives
- (External factor: Update of government policy for infrastructure provision in the future)

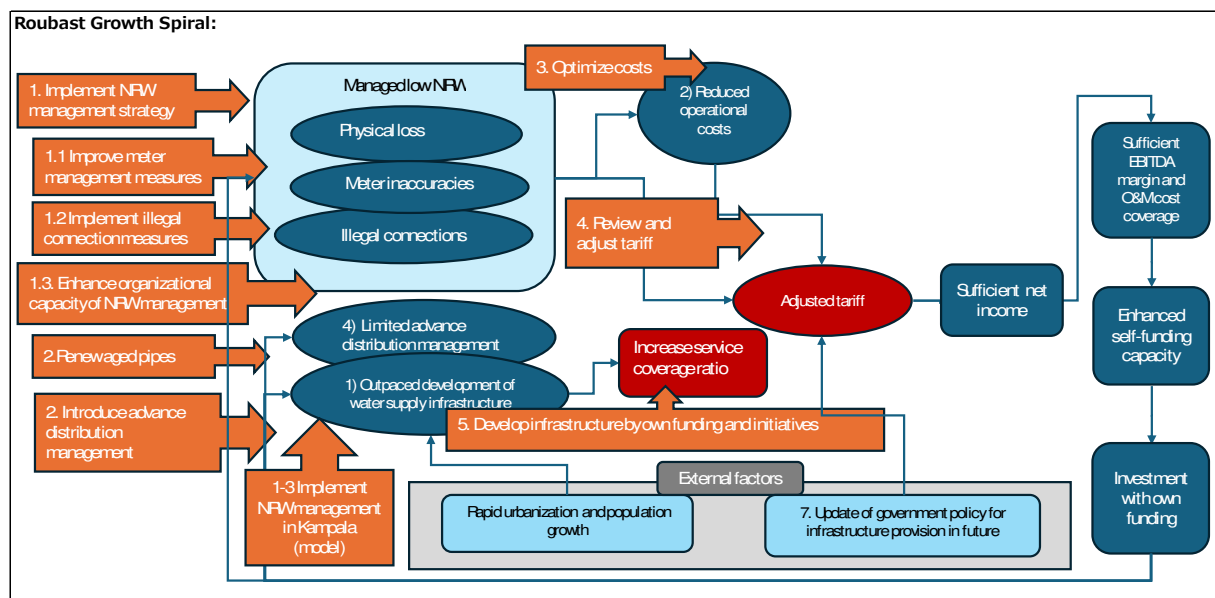


Figure 3-11 Growth Steps (NWSC)

3.4.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to activate NWSC's growth spiral are outlined below.

Outcome 1. The Capacity for NRW management is enhanced.

- 1-1 Formulate a comprehensive plan for NRW countermeasures (coordinating with Outcome 2)
- 1-2 Enhance NRW management capacity (commercial loss and physical losses management and human resources)
- 1-3 Implement NRW management activities

Outcome 2. The aged and outdated transmission and distribution system is modernized and renewed with priority of Kampala.

- 2-1 Formulate a replacement plan with zoning and SCADA for the distribution network and conduct a feasibility study
- 2-2 Raise funds to replace aging pipes
- 2-3 Implement the priority projects outlined in the feasibility study

Outcome 3. A long term plan of cost reduction and revenue generation to improve the O&M costs coverage ratio is developed and implemented.

- 3-1 Plan cost optimization measures including NRW reduction and electricity cost reduction
- 3-2 Plan revenue increase measures including increase of customer base, improvement of collection efficiency, etc.
- 3-3 Implement the plan

Outcome 4. A comprehensive long-term financial plan to support capital investments is developed.

- 4-1 Develop/update tariff study including affordability analysis
- 4-2 Formulate a long-term financial plan including prioritizing capital investments from small to large scale
- 4-3 Develop a fund mobilizing strategy

(2) Improvement scenario

By implementing the activities for Outcomes 1, 2, and 3 in parallel, and then carrying out the activities for Outcome 4, the mid-term goal will be achieved. The improvement scenario for NWSC, based on the outcomes and activities, is as follows.

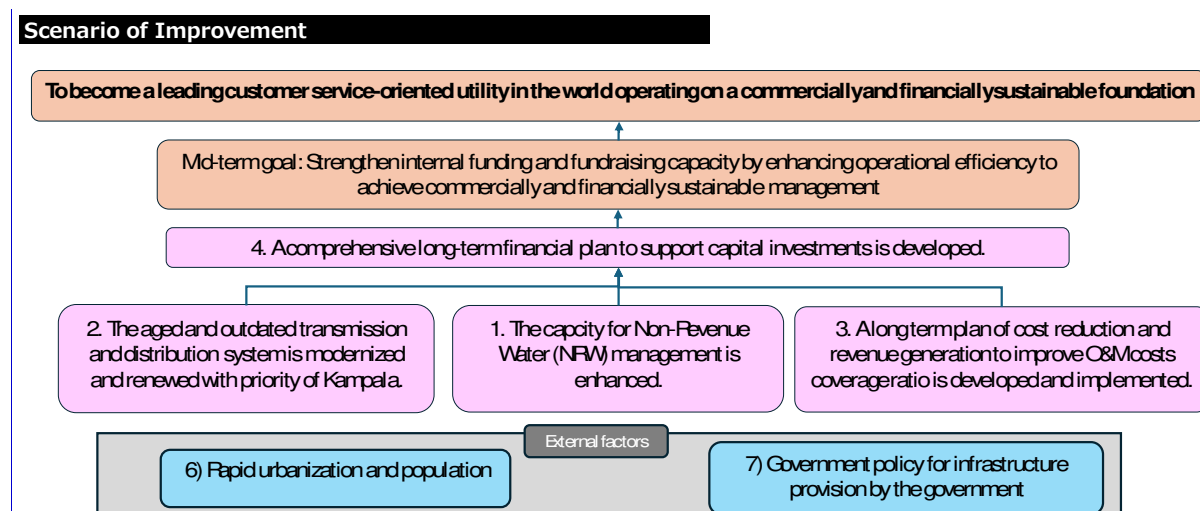


Figure 3-12 Improvement Scenarios (NWSC)

3.4.2. Details of discussions with utility

3.4.2.1. First field survey

(1) Meeting counterpart

The Senior Director of Business and Scientific Services Department was designated as the main counterpart and chaired an executive briefing meeting, attended by senior executives from departments related to planning, finance, internal audit, and performance monitoring and evaluation, which was organized to explain the results of the NWSC's diagnostic and solution analysis. Although it was not possible to meet with the Managing Director, the Vice Managing Director (Technical) was interviewed to explain and discuss the results of the analysis, as well as to collect information.

(2) Comments on the analysis results and recognized challenges by utility

a) Comment on analysis results

- Growth spiral analysis
 - Although the NWSC covers the entire country, it would be interesting to examine the growth spiral by isolating just the regional offices, such as Kampala. This would provide us with the material to determine which spiral elements to invest in.
- Bottleneck analysis
 - There is a sufficient surplus in water production capacity. That is not a bad situation. It means that there is potential for expansion. We need to expand our connections in the future.
 - Water tariffs are adjusted based on an index system to reflect inflation. However, they were not increased during the period affected by COVID-19; although tariff increases were implemented in 2021, 2022, and 2023, the full amount of the deferred increases has not yet been reflected. Kampala alone may be able to invest in itself.

- NRW countermeasures must be implemented in a balanced and sustainable manner, incorporating engineering, meter replacement, and project management. It is crucial to develop hypotheses, create scenarios, and execute accordingly.
 - The outstanding payment period for public institutions has reached two years. Even with the installation of prepaid meters, it is difficult to suspend the water supply once the credited amount has been used up. Prepaid meters are mainly used for connecting the informal sector in urban areas.
 - Sewerage requires greater investment; however, a key challenge is that citizens do not find it attractive to connect to the system.
- Strategy analysis
- Government approval is required to increase water tariffs.
 - The utilization of own funds is intended for infrastructure that generates cash flow for repayment as a critical asset.
- Financial improvement through implementation of NRW
- A cost-benefit analysis is necessary. The analysis should include the costs associated with NRW measures.
- b) High NRW measures
- Of the total NRW, physical losses account for 17%, while non-physical losses account for 23%. The primary causes are illegal connections and unregistered water volume due to meter registration issues.
 - Kampala has the most significant NRW problem, making it essential to address the issue first. The approach taken in Kampala can serve as a model for other regions. A network restructuring plan for Kampala is under consideration. To improve water pressure, increasing water production capacity is the first priority. Historically, Kampala's distribution network was divided into high-zone and low-zone areas. However, over time, these zones have been interconnected, making pressure control difficult. As a result, excessive water pressure has led to increased leakage.
 - The replacement of aging pipelines and water meters is necessary. For water pipes that are buried at shallow depths, countermeasures such as deeper installation are being implemented.
 - The issue of meter registration arises from the British-style gravity-fed distribution from reservoirs and the use of elevated storage tanks in households. This results in reduced nighttime water volume and slower flow rates, leading to undetectable water flow by water meters. Additionally, in apartment buildings, large-diameter pipes are often split into smaller ones with individual meters, causing unregistered water volume. In some cases, 20% of the total volume per cubic meter goes unregistered.
 - Illegal connections are also found among customers with high payment capacity, such as shopping malls and student dormitories. Detecting illegal connections requires collaboration with security personnel and other field staff.
- c) Affordable water tariffs
- As per government regulations, water tariffs include operation and maintenance costs, depreciation

costs, and service connection costs. The tariff structure incorporates cross-subsidization to address disparities among low-income households and between different regions. By producing bulk water and supplying it to rural areas, overhead costs can be reduced, ensuring nationwide equity in water access.

- In 2023, tariff adjustments were made based on an index that accounted for inflation, exchange rate fluctuations, and electricity costs. However, during the COVID-19 period, index-based tariff increases were suspended to accommodate customers' inability to pay. The tariff structure has not been reviewed for a long time. The government prioritizes affordability in setting water tariffs. Unlike in some countries, Uganda does not experience political interference in water tariff decisions.

d) Delayed payments by public institutions

- The bill collection rate is nearly 100%. However, while the payment period for commercial and residential connections is short, public institutions have a significant debt age due to delayed payments.
- High Labor Cost Ratio
- To improve the staff-to-connection ratio, the number of connections must be increased, targeting international best practices. Labor and management costs are high across both urban and rural areas. In rural areas, low revenues do not cover O&M costs, yet competitive salaries are necessary to attract personnel.
- When integrating community water supplies, staff interviews are conducted, and personnel without the required minimum skills may be reduced. However, political challenges make layoffs difficult, resulting in overstaffing.
- Currently, personnel costs account for 46% of all maintenance costs, with a goal to reduce this to 33%. New hiring was frozen in 2022, and hiring reductions continue as a strategy to manage labor costs. While reducing staff, the organization aims to compensate by increasing overtime work and improving individual performance.
- A part-time employment system is under consideration to optimize human resources. Employees aged 50 to 55 may engage in non-business activities part-time to prepare for retirement, while high-performing retirees can continue part-time work beyond the retirement age of 60.

e) Administrative costs

- During the COVID-19 period, personnel expenses were frozen, leading to a significant increase in FY 2023 to compensate for previously unadjusted salaries.
- Maintenance in rural areas was also postponed, leading to increased travel expenses for maintenance work.
- Electricity costs rose due to higher tariffs and the addition of new facilities.

f) Type of investment funds

- Investment funds include internal funds, development partner (DP) funds, and government grants. Larger investments are primarily financed through DP funds, leveraging additional resources. For

water distribution infrastructure in small areas, NWSC relies on borrowing. Increased revenues are reinvested into the system.

- Any borrowing by NWSC from private banks requires congressional approval. According to a World Bank study, NWSC has a borrowing capacity of up to Ush 1 trillion, with approval granted for Ush 300 billion. Borrowed funds are allocated to high-return projects.
- 100% Service Coverage Acceleration Project (SCAP100) aimed to expand water supply to rural areas, with 42% subsidized by the government and the remainder financed by NWSC as a social investment.
- Water tariffs are uniform nationwide. As a result, O&M costs in rural areas are covered using revenues collected in Kampala.
- In contrast, in countries like Kenya and Malawi, where different water utilities operate in different areas, cross-subsidization between areas is not possible. NWSC is unique in Africa as the only utility capable of securing financing from private banks.

g) Cash management and accounts receivable management

- While there is no specific cash management policy, cash on hand appears substantial. However, these funds are tied to donor-funded projects and held in accounts at the Central Bank of Uganda.
- The allowance for doubtful accounts appears small because the primary unpaid debts are from the government, which has delayed payments for an extended period. For other customers, collection efficiency is at nearly 100% due to timely payments.

h) Long-term financial policy

- Some priority projects lack secured funding. Alternative financing sources, including commercial bank loans and bond issuances, are being explored. The Ugandan government also aims to promote bond issuance, but no specific strategy has been established. If bonds are issued, it is expected that water tariff revenues will be allocated to an escrow account for bond repayment. However, the government has no remaining borrowing capacity currently approved.
- In the long term, the goal is to enhance water access while ensuring financial sustainability. Given the limited ability to pay in rural areas, the government must bear a portion of the financial burden. Regional cross-subsidies are in place, aligning with the government's policy of "Providing water for all."
- Currently, O&M costs and minor investments are covered by water tariff revenues, while major investments are financed by the government and development partners.

(3) Reactions and views of utility executives on solutions and approaches

The solutions are understood. Leakage solutions should assume priority areas because of the scale of the project. The criteria for project selection are the need for water access, availability of resources, the priority of DP, and political preference. The decision will also be made in consultation with the local government. Please send us a revised version with updated operational indicators based on the data collected during this trip.

(4) Action plan

The action plan was to collect and share the following materials. Almost all necessary materials were received.

Table3-8 Action Plan (NWSC)

No.	Materials	Received or not
1	Kampala NRW Action plan	Received
2	Analysis of physical losses in Kampala water	Received
3	Concept of meter accuracy study for Kampala	Received
4	Draft tariff study	Received
5	Fourth quarter performance review report	Received
6	Annual report for financial year ending June 2024	Received
8	Illegal connection situation data /report	
9	Pipeline asset summary data (average pipe age by town)	
10	Project selection and prioritization criteria, especially for market financing	

(5) Executive awareness of problems and willingness to improve the organization

Discussions were held with key management executives, excluding the top management. Since 1999, NWSC has successfully implemented a management turnaround. Performance contracts are established at all levels, from executives to staff, ensuring a strong commitment to results. Each department head has a detailed understanding of their department's challenges and continuously formulates improvement strategies. Due to the emphasis on performance, they have a strong motivation for continuous improvement.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	3 The executives are deeply analyzing the issues and preparing countermeasures.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	3 NWSC has long had a vision and mission and has been running the utility with a goal in mind. The executives are also working to achieve the vision.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	2 As a national institution, the executives assess the situation and respond accordingly.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	3 Executives are developing ways to utilize human resources more efficiently. We are trying to strengthen activities related to NRW reduction.

(6) Comparison with desktop survey results

As a result of the field survey, additional details on bottlenecks and external factors were identified. However, there were no major changes to the diagnosis and solutions prepared through the desktop survey. This is because NWSC publishes a wealth of information, including comprehensive annual

reports, allowing for a thorough analysis based on sufficient data and information obtained from the desktop survey.

3.4.2.2. Online consultation after the first field survey

An online meeting was held with the Senior Director of the Business and Scientific Services Department. The final draft of the diagnostic and solution analysis was presented, and its content was agreed upon. The following comments were provided:

- In the 'Negative' section of the FS Analysis, the Accounts Receivable category includes both public institutions and households. It would be beneficial to mention the extent to which delays in receiving these payments impact financial stability. (Related aspects are discussed in the Bottleneck Analysis.)
- It would be helpful to have an estimate of the required investments for NRW reduction, including the type and scale of investments needed. Additionally, a cost-benefit analysis would be valuable.
- NWSC plans to gradually reduce reliance on external funding in the future. The findings of this study should be carefully reviewed to determine investment strategies moving forward.
- Before finalizing the diagnosis and solutions, I would like to share them with NWSC's management team, ensuring their input before the next steps.

3.4.3. Details of discussions with other organizations

3.4.3.1. Government institutions

(1) Ministry of Water and Environment (MWE)

A briefing on the diagnosis and solutions was provided to senior officials of the Ministry of Water and Environment, including the Commissariat, Deputy Senior Officials, and executives from the Water and Sanitation Development Facility (WSDF), which are responsible for the water sector.

a) Comments on the Diagnosis and Solutions

- The analyses on NRW, financial performance, and infrastructure were highly insightful. Uganda has 3,000 water supply systems, and infrastructure indicators should be monitored in real-time.
- The growth spiral framework is intriguing. It would be beneficial to use this framework to analyze indicators and conduct benchmarking at the regional Umbrella Water Authorities (UWA) as well.

b) Regional Water Utilities

- Uganda has 570 municipalities, of which NWSC serves approximately 270. In addition to NWSC, six UWAs cover rural areas.
- NRW levels at UWAs are even higher than at NWSC. KPI achievement is monitored annually, but data collection remains a challenge. Water tariffs at UWAs are subsidized and set lower than those of NWSC.
- The government is encouraging competition between NWSC and the six UWAs, and KPI-based benchmarking should be conducted among all water utilities.

- NWSC has a long history and has developed strong institutional capacity. In contrast, the Water Utility Regulation Department (WURD), which regulates the six UWAs, was established only six years ago.
- While NWSC is a well-managed utility, it faces challenges related to NRW, sustainability, and tariffs.
- The Water and Sanitation Development Facility (WSDF) is making new investments. Once the infrastructure is developed, it is transferred to NWSC or other UWAs depending on geographic location.
- The government expects NWSC to finance infrastructure development using its own funds so that available resources can be allocated to rural areas in greater need.

c) Tariffs

- A new water tariff policy is currently in draft form, along with a revised Water Act. Tariff setting must strike the right balance.

d) Regulations

- Although regulatory functions are currently within the ministry, the government aims to establish an independent regulatory body. Plans are being considered to set up regional offices.
- NWSC requires government approval for borrowing funds. The SCAP100 program is also subject to audits.

e) Expectations for JICA Support

- Strengthening regulatory capacity is necessary.
- Technical support for regional UWAs is needed.
- The WSDF requires support for expanding rural infrastructure, including the introduction of SCADA systems, as well as enhancing operational and maintenance capacity and regulatory capabilities.
- As Uganda's government funds are limited, support from DPs is highly anticipated.

3.4.3.2. Development partners

(1) Agence Française de Développement (AFD)

- AFD has the largest presence in Uganda's water sector.
- AFD's cooperation has traditionally been in the form of soft loans to the government, which are then transferred as grants to NWSC. The government does not allow NWSC to borrow directly. However, this was possible 20 years ago.
- While NWSC covers O&M costs, large-scale investments are funded by the government.
- Although AFD has not previously engaged in technical cooperation, it plans to launch a project in January 2025 focusing on NRW reduction in Kampala. The total budget is €6 million, comprising €2.7 million for technical cooperation and €3.3 million for equipment supply.
- The project will support Kampala and urban areas in southeastern Uganda. In Kampala, the Katosi Water Treatment Plant began operations in 2021. However, in regional towns, the Umbrella Water

Authorities (UWAs) lack capacity and are not independent, making them difficult counterparts for cooperation.

- Previously, NWSC focused primarily on infrastructure expansion, but it has recently shifted its attention to addressing NRW issues.

(2) African Development Bank (AfDB)

- AfDB's most recent cooperation with NWSC was a sewerage project in Kampala, implemented jointly with KfW and the EU. Another project focuses on water supply to 10 towns under the Ministry of Water and Environment, scheduled for completion by the end of 2025.
- NWSC operates not only in major cities but also in rural areas. The 10-town water supply project financed by AfDB is being developed under MWE, but once completed, NWSC will take over operations and maintenance. The Ugandan government is expanding urban water development to make services financially viable and is investing with a long-term perspective. However, this development is progressing even as some towns continue to struggle with aging infrastructure.
- Water tariffs have remained largely unchanged. For a long time, the tariff has been set at 5,000 UGX/m³ (approximately \$1.5/m³). Political factors are believed to be behind this stagnation. With national elections scheduled for early 2026, it is unlikely that the government will approve any tariff increases in the near future.
- Most loans to Ugandan local governments are sovereign borrowings through the Ministry of Finance. While the ministry treats these as loans, it provides the funds to NWSC as grants. If NWSC were to receive direct financing, it would need to raise water tariffs to repay the debt, which the government does not support. Therefore, the Ministry of Finance secures loans from AfDB, manages repayments, and transfers funds to NWSC as grants.
- The government provides substantial subsidies to sustain NWSC's operations. However, if the government determines that NWSC has reached a level where it can service non-sovereign loans, it will begin reducing subsidies.
- There are no concerns regarding NWSC's governance and financial management.
- The solutions proposed in this study are valuable and should be presented to NWSC. However, discussions will likely need to take place at the executive level. The key issue will be whether financing should come from water tariffs or international development partners. Given the political climate, the former is unlikely to be pursued in the near future.

3.5. Lilongwe Water Board (LWB)

3.5.1. Results of utility analysis

3.5.1.1. Results of analysis after desktop survey and field study

(1) Updated indicators and information sources

Table3-9 Key Performance Indicators (LWB)

KPI #	KPI	Data(FY2023/2024)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (MWK)	42,632,508	-	↗
2	Production capacity (m³/day)	125,000	-	→
3	Production (m³/day)	112,383	-	↗
4	Utilization ratio of production capacity (%)	90	-	↗
5	Continuity of Service (Hrs/day)	22	2	→
6	Quality of water supplied (Compliance rate: %)	97	4	→
7	Water supply pressure (m)	3 (in low pressure areas)	-	-
8	Leakage ratio (%)	25.1	-	→
	2.Increased customer base and satisfaction			
9	Population served	1,120,085	-	↗
10	Service coverage / Water coverage (%)	95.0	4	↗
11	Customer satisfaction (%)	NA	NA	↗
12	Water sold (m ³ /day)	66,394	-	↗
13	Water consumption per capita per day (L/ca/day)	59.3	-	→
	3.Increased tariff revenue			
14	Turnover from sales (MWK)	37,959,605	-	↗
15	Collection ratio (%)	95	3	↗
16	NRW ratio (%)	40.9	1	→
17	Metering ratio (%)	100	4	→
18	Water tariff level (USD/6m ³)	2.55	-	-
	4.Improved financial management			
19	Accounting system	Accrual accounting	3	→
20	Net income (MWK)	33,691,431	-	↗
21	EBITDA (MWK)	20,975,869	-	↗
22	EBITDA margin (%)	55.3	3	↗
23	EBITDA margin excl. deferred income (%)	50.3	3	↗
24	Total capital operating margin (%)	3.2	-	↗
25	Operating Profit Margin (%)	39.2	3	↗
26	Equity ratio (%)	26.0	2	↗
27	Fixed long term conformity rate (%)	81.1	3	↗
28	O&M cost coverage ratio (%)	134	3	↗
29	O&M cost coverage ratio excluding subsidies (%)	127	2	↗
30	Unit cost of water supply (MWK/m ³) (Overall cost including DEP/Water sold)	1,498	-	→
31	Supply price (MWK /m ³) (Turnover from sales/ Water sold)	1,566	-	↗
32	Subsidies (MWK)	0.0	-	→
33	Development Partner grant support (MWK)	1,611,248	-	↗
34	The ratio of subsidies and DP support to turnover	4	-	→
35	Number of staff per 1,000 connections	5	3	→
	GDP per capita (USD)	602.3		
	Inflation rate (%)	28.8		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis (FS Analysis)

1) Summary

- The O&M cost coverage ratio recorded slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. The O&M cost coverage ratio excluding subsidies is 127%, indicating it is relatively less dependent on government subsidies and development partners grants.
- The water revenue increased during the last two financial years rapidly, 61% in FY2022/2023 and 21% in FY2023/2024 respectively. The supply price per m³ continued to increase around 19% in the last three years. The sold or billed water volume increased by 7% from last year. The increase

of tariff accounted for 68% of the water revenue increase in the FY2023/2024.

- On the cost side, the staff costs account for 28% of expenses. The electricity costs are the second largest cost, accounting for 12%. The increase in staff cost and electricity costs were the main factors contributing to the increase in cost.
- About the balance sheet, borrowings from donors account for the major part, and loans are repaid on time. Capital under construction accounts for the major part of fixed assets, indicating that donor loans are used for capital investment.

【Note】

- Comparing BS and PL figures from year to year, high inflation rates need to be considered.
- The addition of the sewerage work in the scope of business responsibility from October 2023 increased expenditure.
- There were simple errors such as the omission of items in the calculation in the financial statements.
- It should be noted that the sudden EBITDA margin improvement to 41% in FY2023/2024 is caused by a one-time exchange gain. Excluding this exchange gain, the EBITDA margin is 25%, indicating a slight improvement from 20% in the last financial year

2) Positive

- Turnover covers operating costs without subsidies.
- The capital investment is funded by loans from donors, indicating less reliance on subsidies, so the financial soundness of LWB is high.
- Capital expenditures are funded by operating cash flow, and the company has been successful in borrowing and investing using equity capital as leverage.

3) Negative

- Turnover has not increased compared to the pace of inflation, cost of sales increases, and water tariff structure changes.
- The accounts receivable turnover is 115 days, which exceed the fee collection deadline. In addition, more than 70% of customers have exceeded their payment due dates.

(3) Summary of bottleneck analysis

(Internal Factors)

a) High utilization of water production capacity and rising water demand

- The construction of a new water treatment plant (50,000 m³/day) is currently underway. Once completed, it will increase water production capacity, allowing for an expansion of the customer base and improvement of supply hours. However, this additional capacity will only be sufficient to meet projected water demand until 2027. Currently, the Lilongwe River serves as the primary water source, but there is a plan to supply treated water from Lake Malawi to Lilongwe City. A feasibility study for this project has already been conducted with financial assistance from local banks. Additionally, efforts to secure alternative water sources are progressing, ensuring a continuous

increase in water production capacity.

- While water production capacity will not be a bottleneck, water resources will become increasingly costly as they become scarcer. Therefore, effective water resource management is crucial to ensuring long-term sustainability.

b) Persistently high NRW ratio

- Current NRW status:
 - The total NRW stands at 41%, with 25% attributed to physical losses. Commercial losses stem from water theft, meter under-registration, and unread/unbilled accounts. Aged pipeline infrastructure, particularly asbestos cement (AC) and galvanized iron (GI) pipes, estimated to be over 40 years old, contribute significantly to frequent bursts and leaks. Additionally, exposed pipes in the distribution network further exacerbate leakage issues.
- Recent NRW reduction efforts:
 - The JICA Technical Cooperation Project aimed at reducing NRW was recently completed, and its effectiveness has been positively evaluated. LWB has a dedicated NRW department, and key interventions, such as DMA zoning and SCADA monitoring, have been implemented. LWB management acknowledges the need for continuous NRW reduction efforts within DMAs, and it is expected that the NRW ratio will gradually decline through initiatives such as the DMA-Level Performance-Based Incentivized NRW Reduction Program, which seeks to expand the successful measures implemented under JICA and the World Bank projects to other zones.
- Challenges & capacity development needs:
 - Despite ongoing efforts, challenges persist in areas such as hydraulic calculations, water pressure management (including regular bulk meter testing), leakage surveys, and GIS applications. Strengthening capacity in these areas will significantly enhance the efficiency and effectiveness of NRW reduction measures.
- Pipeline renewal progress:
 - So far, 429 km of aging pipelines (including asbestos and other deteriorated pipes) have been replaced, contributing to improved network reliability. The total pipeline network spans 2,634 km, with approximately 400 km still requiring urgent replacement. The planned replacement of these remaining pipelines is essential to further reduce physical losses and enhance system efficiency.

c) Unregulated tariff adjustment and its process

- The primary driver of the significant financial improvement in FY2023/2024 was the tariff increase implemented in August 2023. However, since 2018, tariff adjustments have only occurred twice—in November 2021 and August 2023. There is no automatic mechanism to adjust tariffs in response to inflation, exchange rate fluctuations, or electricity tariff increases. Any tariff revision requires approval from the Ministry of Water, creating uncertainty in the timing and frequency of adjustments. There is growing concern that future tariff revisions may not keep pace with inflation and other economic conditions beyond 2023, which could weaken financial capacity. Additionally,

customer affordability across different segments must be assessed to ensure that tariff adjustments remain feasible while maintaining financial sustainability.

d) Delayed payments by government institutions

- The accounts receivable turnover is 124 days. The impairment cost is calculated at 18% for the accounts receivable which are past due 180 days or more. This signifies needs for improvement in collection. The on-time bill payment ratio of government institutions is very low, significantly impacting LWB's cash flow, especially under high inflation conditions.

(External factors)

e) Unmanaged Watershed for Water Supply Sources

- Increasing turbidity due to watershed development
 - Deforestation, urbanization, and agricultural expansion in the watershed have led to higher silt inflow, particularly during the rainy season. This has caused a significant increase in turbidity, which was not an issue in the past. Higher turbidity increases treatment complexity and chemical costs, impacting overall efficiency.
- Sediment accumulation & treatment challenges
 - Tributaries contribute to high turbidity after water is discharged from Kamuzu Dam into the Lilongwe River. While the dam has flushing outlets to release accumulated silt during floods, screen clogging at the intake system of water treatment remains a frequent issue. Increased sediment load may shorten infrastructure (pumps) lifespan and raise operational costs.
- Need for improved watershed management
 - Without sustainable land and water resource management, the impact of urban expansion and climate variability will further degrade water quality.
 - Strengthening catchment protection, afforestation, and erosion control measures is essential for long-term water security.

f) Macroeconomic challenges, especially the high inflation

- Malawi has experienced high inflation and currency devaluation, which have adversely impacted financial sustainability. Without tariff adjustments and improvements in operational efficiency, these economic conditions pose significant financial challenges.
- In addition to that, the Malawi government is in tight financial condition and undergoing adjustment and reforms, committed under the Extended Credit Facility (ECF) arrangement with IMF. This might be a reason for the change of cash management of WBs. The government decided for WBs to deposit its cash to the central bank from April 2025. These tightening financial management might affect WBs.

g) Need for cooperation with local governments

- LMB intends to expand its service area and needs cooperation of the local governments to find additional areas for water supply coverage.

(4) Overall diagnostics of growth spiral

The four spiral elements are working or working well in FY2023/24. While the LWB is on a growth spiral, the 68% increase in water revenue was attributed to the tariff hike in FY2023/2024. In addition, the O&M cost coverage ratio only recorded a slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. This suggests the need for improvement of efficiency. Thus, the following are concern for all spirals to continuously work well in the near future.

- The use of capital investment to increase production capacity given the high utilization ratio of water production capacity.
- Operation efficiency improvement including measure against high NRW ratio.
- The possibility of regular tariff adjustments, given the over 20% inflation rate.

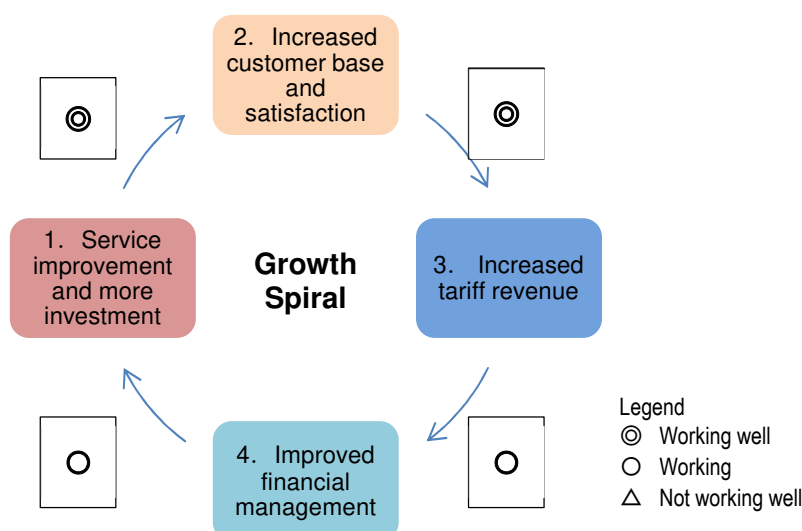


Figure 3-13 Growth Spiral Diagnostic Results (LWB)

(5) Strategic analysis

1) Medium-term targets and recommendations

In the strategic analysis, higher-level goals that encompass LWB's mission and vision were created. Based on these higher-level goals and considering plans such as LWB's First 10-years Implementation Plan (MIP-1, 2021-2030), the mid-term goal necessary for LWB to activate the growth spiral was set.

■ Mid-term goal: Water supply reliability along with financial sustainability is further enhanced

a) Sustaining High Financial Performance for Long-Term Growth

- To ensure the growth spiral functions effectively in the long term, LWB must maintain strong financial performance.
- A greater focus on operational efficiency, including NRW reduction and timely tariff adjustments that consider affordability, is essential.

b) Strengthening NRW Reduction Efforts

- The dedicated NRW team and DMA management, along with the outcomes of the JICA technical

cooperation project, will enable sustained and effective NRW reduction, leading to a steady decline in NRW levels. Addressing remaining challenges, such as replacing aging asbestos pipes, improving hydraulic calculations, managing water pressure, conducting leakage surveys, and leveraging GIS, will further enhance NRW management efforts.

c) Timely and Affordable Tariff Adjustments

- Tariff adjustments should be timely and aligned with inflation and currency devaluation, while ensuring affordability for all customer segments.

d) Expanding Water Supply Capacity for Sustainable Growth

- Current efforts to increase water production capacity will help achieve 100% coverage and extend water supply service hours, reinforcing the sustainable growth spiral.

e) Addressing External Challenges

- Unmanaged watershed degradation affecting water supply sources requires coordination with other stakeholders to ensure sustainable resource management. High inflation and currency devaluation must be closely managed to mitigate financial risks.

2) Growth steps

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram).

1. Implement NRW management strategy (DMA-based)
 1. Enhance on-time bill payment
 1. Regulated tariff adjustment and its process according to economic conditions (External factor)
 2. Continue renewing aged and AC pipes
 3. Optimize costs including reduction of production/treatment cost
 4. Coordination with other stakeholders (External factor)
 - 4.1 to ensure sustainable water resource management
 - 4.2 to find additional water supply areas
 5. Continuous exploration of water sources and expansion of production capacity
- Lead NRW management technology transfer in Malawi

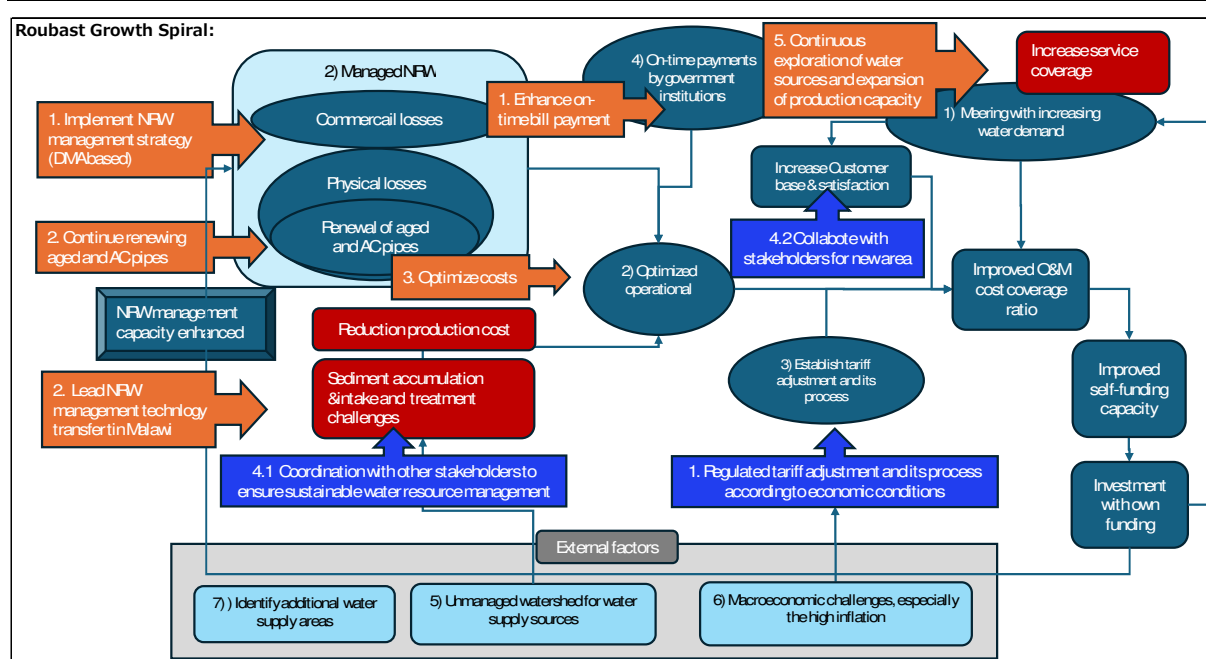


Figure 3-14 Growth Steps (LWB)

3.5.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to enhance and sustain LWB's growth spiral are outlined below.

1) Internal factors

Outcome 1. DMA-based NRW management is enhanced and aged and AC pipes are continuously renewed.

- 1-1 NRW DMA-based management plan to extend to all DMAs is prepared and implemented based on JICA TC project results.
- 1-2 Establish asset management system with GIS
- 1-3 Formulate a replacement plan for the distribution network and implement it considering the priority
- 1-4 Improve SCADA for control function

Outcome 2. Operation efficiency is enhanced.

- 2-1 Optimize bill collection (Account receivable turnover).
- 2-2 Optimize costs

Outcome 3. A mid to long-term financial management plan is developed for stable debt service capacity and predictable water tariff

- 3-1 Strengthen monitoring of performance to analyze the reasons and actions to be taken for improvement during the financial year.
- 3-2 Seek for a timely tariff adjustment, reflecting inflation, and exchange rate fluctuation,

including the operating cost of the new facility in LWB

3-3 Implement affordability analysis for tariff revision and consider adequate tariff structure

3-4 Formulate a long-term financial management plan including prioritizing capital investments, improvement of collection rate, and assuring debt service

Outcome 4. Continuous exploration of water sources and expansion of production capacity

4-1 Explore cost-optimized alternative water sources

4-2 Make a plan for water demand management & conservation

2) Action to achieve the overall goal by LWB

Outcome 5. LWB leads NRW management technology transfer in the country.

5-1 Disseminate knowledge and experience including NRW management to other utilities
(Seminar, Lecture, etc)

5-2 OJT in LWB DMA sites

3) External factors

Outcome 6. The regulatory framework, particularly the tariff adjustment procedure, is established and operational.

6-1 Establish an independent regulator, whose function includes tariff adjustment

6-2 (The regulator to be established) to develop standard model of tariff adjustment

6-3 (The regulator to be established) Implement regular tariff adjustment

Outcome 7. LWB coordinates with other stakeholders to ensure sustainable water resource management.

7-1 Strengthen regulatory measures to control deforestation, urban expansion, and unregulated farming to preserve water resource areas for water supply

7-2 Enhance community engagement & awareness to protect water sources

7-3 Develop climate resilience strategies to mitigate future risks from extreme weather patterns (flood and drought) and cyclone

7-4 Implement reforestation and afforestation programs to reduce soil erosion.

Outcome 8. LWB collaborate with local government to find additional service area

8-1 Collaborate with local government to find additional service area

(2) Improvement scenarios

The improvement scenario for LWB, based on the outcomes and activities, is as follows. While addressing external factors (7.1, 7.2, 8), the activities for Outcomes 1, 2, 3, and 4 will be implemented in parallel to achieve the mid-term goal. Additionally, the activities for Outcome 5 will be carried out as part of the efforts towards the higher-level goals, contributing to the achievement of some of these higher-level goals.

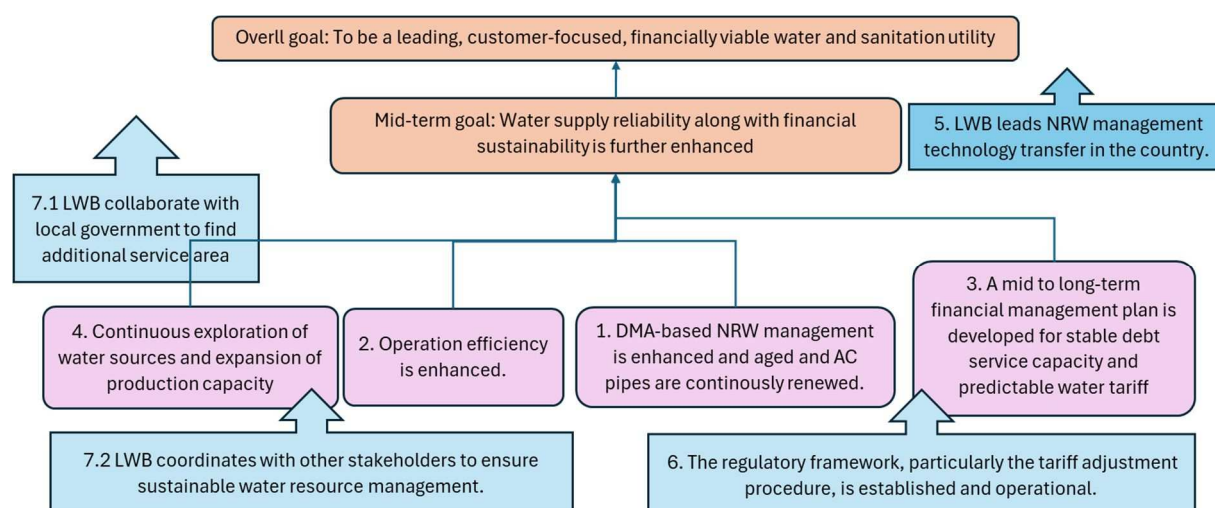


Figure 3-15 Improvement Scenarios (LWB)

3.5.2. Details of discussions with utility

3.5.2.1. First field survey

(1) Meeting counterpart

The CEO and all executives attended the general briefing meeting, where discussions were held, including comments and questions regarding the presentation. During the wrap-up meeting following the visit to LWB, the CEO, along with the executives, also participated reviewing the collected information and the revised version of the diagnosis and solutions.

(2) Comments on the analysis results and recognized challenges by utility

1) Utility analysis

a) Comments on indicators

- Water tariff revisions are aligned with those of other water utilities. Compared to other utilities, LWB's water tariffs are relatively low. Last year, water tariff revenues were below budget, leading to cost control measures.

b) Growth spiral analysis

- An independent customer satisfaction survey confirmed an increase in satisfaction levels.
- An NRW strategy was developed with JICA's support and is currently being implemented. In November, NRW in the Southern region improved to below 30%, though NRW in the Central region remains a challenge.
- Reducing NRW is essential for cost reduction, and investment is required for NRW improvements.
- Sharing JICA's technical cooperation experience is already being implemented within JICA projects, in collaboration with the Water Service Association.

- Significant improvements in customer satisfaction since 2016 resulted from the implementation of a turnaround strategy, which increased investments for pipeline rehabilitation and the expansion of customer service centers.

2) Challenges

a) Water tariffs

- LWB is a government institution, and water tariffs are determined by the government. However, the government does not consider all costs when setting tariffs, as other factors, such as social benefits and affordability, are also taken into account.
- LWB has an internal tariff model for budget management. Currently, tariffs are set based on cost recovery, but there is no index-based adjustment for inflation. The establishment of applications or guidelines is needed.

b) Infrastructure investment plan

- An investment plan targeting 2063 is under development and is expected to be completed by January 2025.
- Prioritization is being conducted, and feasibility studies for 10 projects are underway. The plan includes expanding supply capacity and improving efficiency through network extension.

c) NRW

- Physical losses are estimated at 63% of the total NRW ratio.
- DMA (District Metered Area) management has been introduced under JICA's technical cooperation. Expanding DMA-based NRW management across other regions is necessary, while also considering operational efficiency.
- A World Bank project is supporting the installation and monitoring of 109 DMAs. Water pressure management is also being strengthened, with the maximum pressure reduced from 100m to 70m. DMA management will be further optimized to improve pressure control.
- As part of asset management, pipeline registration is being conducted. Currently, only installation years are recorded, but this helps identify pipelines that need replacement.

d) Financial management

- Exchange gains occur on grants and loans. The Malawian government borrows from institutions like the World Bank and lends to LWB in local currency. Since repayments are made in local currency, LWB does not bear foreign exchange risk.
- Grants, however, are received in foreign currency and kept in foreign currency accounts. As the local currency depreciates, exchange gains are realized.
- No reserve funds have been set aside for loan repayment.
- Although LWB holds significant cash reserves, these funds are tied to donor-funded projects. The funds are temporarily held as cash until disbursements are made, and in the meantime, they are invested in short-term financial instruments.
- The impact of cyclones included restoration costs for damaged infrastructure and temporary

deferment of water bill payments for affected residents.

- Water tariff calculations consider operating costs, loan repayments, project investments, and production capacity.
- LWB has an internal tariff calculation model for management purposes, but there is no unified model for tariff calculations. An independent regulatory body for tariff setting is desirable.

e) Requested support from DPs

- 1.5 MVA Diesel Standby Generator at the Northern Booster Station: In case of power outages, a one-hour power cut requires four hours of recovery time.
 - Replacement of asbestos pipelines, which is the most costly infrastructure upgrade.
 - Implementation of a DMA-Level Performance-Based Incentivized NRW Reduction Program:
- ✧ This initiative aims to expand the JICA and World Bank-supported projects to other zones using internal personnel.
- ✧ While DMA installations have been completed, further improvements in DMA management are required. Additional support for DMA management is also needed.

(3) Reactions and views of utility executives on solutions and approaches

- The current strategic plan will end in June 2025, and we would like to incorporate the findings of this study into the next strategic plan. This study was conducted at an ideal time. Please share the updated report.
- The results of this study align with LWB's own assessment. The findings have reaffirmed LWB's operational performance.

(4) Action plan

The collection and sharing of the following documents were set as the action plan. Most of the necessary documents have been collected.

Table3-10 Action plan (LWB)

No.	Request for information	Received or not
1	Independent customer satisfaction survey	OK
2	KPI management of leakage	OK
3	Water balance as leakage ratio	OK
4	Investment plan TOR and list of 10 projects	OK
5	Areas of request to DP for assistance	OK
6	Financial analysis on FY2023/2024	OK
8	Check Sold water volume	OK

(5) Executive awareness of problems and willingness to improve the organization

In the executive briefing meetings, nearly all executives, including the CEO, actively participated and made commitments to this study. The CEO also attended the wrap-up meeting and expressed the intention to utilize the study results as a reference for preparing the next strategic plan.

LWB has already completed its turnaround process, achieving investments in water infrastructure,

service improvements, and financial enhancement. The CEO and department heads have a deep understanding of their respective challenges.

A feasibility study for initiatives to be implemented over the next decade has already commenced, reflecting a strong commitment to continuous improvement.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	4 LWB has completed the World Bank's management reform project, the CEO has a good grasp of all the issues and is preparing countermeasures.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	4 The CEO regularly creates strategic plans, draw up improvement lists, and conduct feasibility studies.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	2 As a national agency, the CEO assesses the situation and responds accordingly.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	4 The World Bank's management reform was a success, and the company is aiming for further improvement. It is also working to disseminate the results of the JICA NRW technical cooperation project to the entire region.

(6) Comparison with desktop survey results

As the Turnaround (management reform) project is being implemented with the World Bank support, there is a wealth of publicly available materials on utility analysis, evaluation, and strategic planning. This allowed for a relatively comprehensive analysis based on sufficient data and information through the desktop survey. As a result, no major changes were made, even after incorporating additional information.

During the field survey, detailed bottlenecks were identified. Additionally, two external bottlenecks were newly recognized and incorporated into the proposed solutions.

1) Additional bottlenecks

- Delayed payments by government agencies
- Additional external factors
- Inadequate management of watersheds that serve as water sources
- High inflation and currency devaluation
- Need for cooperation with local governments (expansion of water supply areas)

2) Add external factor issues to the strategic analysis

3) Add Solution

- Improved operational efficiency.

- Continued search for future water sources and expansion of production capacity will proceed.

3.5.2.2. Online consultation results

Taking advantage of the opportunity during the BWB visit, the JICA Study Team planned to hold a meeting with LWB. However, scheduling conflicts prevented an on-site meeting. As a result, the survey results were presented online to the CEO and other executives. The CEO expressed his gratitude and mentioned that he would like to use the findings as a reference for the upcoming strategic plan currently under development.

3.5.3. Details of discussions with other organizations

The hearing results regarding BWB, as described in section 3.6, will also be included in this section as part of the discussions on the Malawi water sector.

3.5.3.1. Government institutions

(1) Ministry of Water and Sanitation (MWS)

Meetings were held with two departments of the Ministry of Water and Sanitation: Department of Water Supply Services and Department of Water Resources.

1) Department of Water Supply Service

a) Role of MWS

- Under the Waterworks Act of 1995, MWS serves as the regulatory authority. With support from the World Bank, efforts are underway to establish an independent regulatory agency, and the new Waterworks Act is targeted for approval by the end of 2025/2026. As the regulatory body, the Ministry's responsibilities include approval of water tariffs (by the Minister), approval of water supply areas managed by the Water Board, oversight of the Malawi National Drinking Water Quality Standards (MNDWQS), and monitoring and evaluation including customer satisfaction and supply duration metrics for the Water Board. Since water supply is provided not only by the Water Board but also by NGOs, regulations covering these entities are also being considered. In addition, the envisaged organization is expected to regulate sewage. This institutional reform is being supported by a World Bank project.
- Through a World Bank-funded project, performance-based financing is being implemented. Based on the experience gained from its implementation with BWB, expansion to other Water Boards is under consideration.

b) Water tariffs

- After receiving a request for a water tariff change, a cost review is conducted. However, it is not certain whether the proposed tariff will be approved. It is preferable to have an independent regulatory agency to minimize political influence. Due to public health concerns such as cholera, raising water tariffs can sometimes be challenging. Although the inputs for calculating water tariffs are consistent, there is no standardized calculation format, and the tariffs are not indexed to inflation.

In addition, there are neither guidelines nor a standard format in place. Establishing an annual tariff adjustment framework would be beneficial.

c) Borrowing for WB investments

- Borrowing from DPs is conducted through the Ministry of Finance and MWS.

d) Support for BWB

- For measures aimed at improving BWB's management, the MWS is mediating discussions with the Ministry of Finance. BWB requires energy-efficient pumps and an independent power source—meaning a power supply from sources other than the state-owned power company, the Electricity Supply Commission of Malawi, (ESCOM) is needed. A new contract with ESCOM has enabled the application of low-priced nighttime electricity tariffs.
- Regarding delays in payments by public institutions, although government budgeting mandates that each institution must make payments, these payments are deferred. Once every few years, the Ministry of Finance intervenes by making payments via promissory notes. This practice, combined with the depreciation of debt due to inflation, results in a double loss for the Water Board. Moreover, even without payment, connections to hospitals, parliament, and military agencies cannot be disconnected. An independent regulator is therefore necessary. As another measure, the installation of prepaid meters for public institutions is being promoted.

e) Challenges of LWB

- Recently, there have been four instances of power outages in the transmission from ESCOM, posing greater challenges than in the previous year. It would be desirable to have an independent power supply, such as through solar energy.
- Residential areas have developed near LWB's water source, raising concerns about water quality. To mitigate reliance on the river, the installation of a pipeline from the water source to the water treatment plant is being considered.

f) Initiatives by the MWS on NRW reduction

- NRW reduction is being addressed as part of efforts to improve operational efficiency. The MWS plans to hold meetings with the CEOs of each Water Board to discuss strategies for reducing NRW.
- A training plan is being developed. Under the JICA technical cooperation project (Lisap) on NRW, trainees were previously sent to Kenya with support from JICA and others. Additionally, peer-to-peer learning initiatives have been conducted in countries such as Malawi and Zambia.

g) Emergency response for cyclones and other critical situations

- Support for cyclones is not structured, resulting in a double loss for the Water Board—incurring both restoration costs and the costs associated with waiving fees for affected residents. Free water connections have been provided in the impacted areas.
- During the period affected by COVID-19, measures were taken within existing projects to ensure that water connections were not cut off for residents who delayed payment of water tariffs.
- In the drought resilience project, during the 2015/16 drought when river water was depleted, efforts

were made to utilize groundwater.

h) Sector-wide planning

- A Joint Sector Review is conducted annually, and a Sector Performance Review Report is prepared. A Water and Sanitation Investment Plan is currently under development.
- Although water quality standards exist, they lack a legal foundation. With support from the World Bank, water quality standards are being developed.

2) Department of Water Resources

a) Water source development and management

- MWS is responsible for water source development, while the National Water Resources Authority (NWRA) oversees regulation and catchment management.
- Monitoring wells are equipped with data loggers for observation. However, as the process is manual, data cannot be accessed remotely.
- Water level monitoring of dams and flow measurements of weirs are also conducted.
- LWB and BWB primarily rely on surface water, while other Water Boards also utilize groundwater.
- Between 2019 and 2021, a groundwater survey was conducted for LWB's service area. However, borehole drilling did not yield sufficient water.

b) Surface water monitoring

- In collaboration with Water Boards, data loggers are installed for water quantity management. However, data management is manual, and automation is desirable.
- Siltation is a major issue in many rivers. Catchment management is primarily led by NWRA.
 - Due to the impacts of climate change, surface water availability is declining, prompting efforts to enhance groundwater utilization.

(2) NRWA

Interviews were conducted with the NRWA, the organization responsible for water resources management.

a) NWRA's role and overall activities

- NWRA is responsible for the management of dams, surface and groundwater resources, licensing, and water resource development. It also manages wastewater discharge and conducts inspections.
- As a surface water administrator, NWRA's role includes assessment activities such as data collection and monitoring of water quantity and quality to support decision-making.
- During the rainy season, river turbidity increases. The accumulation of sediment during the rainy season is a key challenge for catchment management.
- Water Boards are required to register their water sources and obtain licenses.

b) Challenges (Climate change)

- The dry season has become longer, and many rivers that were once perennial have turned into seasonal rivers.

- Surface water availability is decreasing, making effective management essential.
 - The key challenge is that climate change and deforestation have led to lower water levels in the dry season while increasing water levels during the rainy season. Managing this fluctuation is crucial.
- c) Challenges (Catchment management) – Efforts to improve water quantity and quality
- Deforestation for timber and charcoal production has contributed to the transformation of perennial rivers into seasonal rivers. To address this, committees have been established to implement technical and financial measures, including providing alternative income sources to replace timber and charcoal production.
 - Under catchment management, NWRA has identified critical micro-catchment areas within 17 major water resource areas.
 - To enhance micro-catchment management, nature-based solutions are being implemented to improve catchment conditions and sustain water availability. Catchment management committees have been formed, and alternative income-generating activities such as beekeeping are being promoted to discourage local communities from deforestation. Five WDs are involved in this initiative. Collaboration with the Southern Regional Water Board and Central Water Board has already begun, and LWB and BWB will start participating next year.
 - Afforestation efforts are being carried out to mitigate siltation, which also contributes to greenhouse gas reduction efforts.
- d) Challenges faced by BWB
- The Mudi River, which supplies source water for BWB, has been impacted by deforestation and the lack of buffer zones. Industrial activities have led to water quality deterioration, and sedimentation has turned the river into a non-perennial stream. Regulation of industrial wastewater discharge is necessary.
 - The Kamuzu Dam on the Shire River is facing issues with water hyacinth accumulation, which is being managed by drying the plants and using them as fuel.
 - Unlicensed borehole drilling by private industries is increasing in BWB's service area. In such cases, stop orders are issued, and licenses may be revoked.
- e) Challenges faced by LWB
- Higher turbidity levels have led to increased chemical consumption compared to the past. A long-term analysis would be beneficial to assess trends in chemical usage. LWB is facing challenges related to sedimentation and high-turbidity silt accumulation.
- f) Impact of cyclones
- Major cyclones occurred in 2019 and 2023, and more are expected in the future. NWRA is working with the Natural Disaster Prevention Agency, the Meteorological Agency, and the Climate Change Department to coordinate disaster response efforts. River flow data is monitored and shared with relevant agencies, and awareness campaigns are conducted for communities in flood-prone areas. Collected data is used for informed decision-making to enhance preparedness and response measures.

3.5.3.2. Development partners

(1) World Bank (WB)

a) World Bank's engagement in Malawi

- The World Bank has provided \$100 million in support to LWB over five years, transforming it into a financially viable water utility. Discussions are ongoing regarding the World Bank's future engagement in Malawi's water and sanitation sector. For LWB, the World Bank is considering financial support for commercial loss reduction measures.
- Beyond LWB and BWB, the World Bank is also providing training courses on creditworthiness for Malawi's Ministry of Finance and other relevant government institutions. A platform has been established in collaboration with Kenya and Tanzania to identify common bottlenecks and solutions.
- Malawi lacks independent regulatory bodies not only for the water sector but also for economic and technical oversight, with ministries currently handling these roles. However, ministerial capacity remains insufficient. The World Bank is working with the government to establish a regulatory authority. Since this is an election year, expectations for progress are low, but regardless of the political outcome, the challenges remain the same, so efforts will continue.
- As part of the World Bank's project for BWB, \$5 million has been secured for the relevant ministries, including activities related to the establishment of a regulatory body. Government and BWB officials have been taken to Portugal, Kenya, and Zambia for meetings with regulatory bodies. A regional meeting on regulatory frameworks was held in Blantyre last year to facilitate information exchange.

b) Challenges faced by BWB

- The World Bank is currently collaborating with the Ministry of Finance to support BWB, identifying two key challenges: BWB holds significant debt with ESCOM. The World Bank has developed a debt repayment plan, which is still under monitoring. Financial restructuring plans have been agreed upon between the Ministry of Finance, Exim Bank of India, and BWB, and their progress is being closely observed. Other concerns include high electricity consumption and NRW levels. Regarding dams, only the most critical ones will receive rehabilitation support. While feasibility studies (FS) can be conducted for two smaller dams, rehabilitation funding is not available.
- Solar panels remain expensive for BWB, and it is unclear whether their installation should be a top priority.
- BWB has established a project management unit, but its capacity is insufficient. The World Bank has five to six contracts under implementation with BWB, but BWB's contract management capacity is considered inadequate.
- The World Bank's projects for LWB and BWB are similar, but for BWB, financing beyond \$20 million is performance-based, linked to five key indicators, including NRW. Rather than providing unconditional financing for the entire project, an incentive-based approach has been adopted for BWB. Due to internal confusion within BWB, one of the key indicators (NRW) is being considered

for replacement with electricity consumption as a performance indicator.

- The World Bank does not provide direct technical cooperation with the BWB. However, if BWB requests technical assistance for a specific objective, the World Bank can provide grant-based financial support. For example, the "Change Management" program allows utilities to implement projects independently while hiring consultants to address specific issues. The World Bank requires utilities to engage an Independent Verification Agent (IVA) to monitor and verify project outcomes, ensuring accountability. BWB currently receives support from VEI (Netherlands), which provides expertise on commercial loss reduction.
- For BWB, instead of addressing multiple issues simultaneously, it would be more effective to help prioritize key challenges.

c) Water and sanitation management in Malawi

- Sanitation services in Malawi were previously managed by local governments. However, in October last year, the World Bank supported the transition of sanitation oversight to LWB.
- However, integration between sanitation and water sector management remains incomplete.
- Although the turnaround framework could potentially address some of these challenges, it currently focuses only on the water service sector.

(2) European Investment Bank (EIB)

a) EIB's engagement in Malawi

- The majority of EIB projects focus on infrastructure investment. While some technical cooperation support is provided, it is mostly project-related, with very limited assistance for capacity development.
- The most recent project is focused on the Water-Energy Nexus, aiming to reduce energy consumption and costs for water utilities. This support is specifically targeted at securing renewable energy sources such as solar panels and battery storage systems.
- An ongoing loan project for water treatment facilities involving four water utilities, including LWB, is nearly completed.
- BWB is not included in this project, as it is already receiving substantial support from the World Bank, and EIB does not want to interfere with that assistance.
- LWB is currently benefiting from an ongoing EIB project. LWB has been investing independently, maintains relatively high water tariffs, and has sufficient cash reserves.

b) DPs support in Malawi

- The Netherlands' VEI provides long-term technical cooperation at the grassroots level for Malawian water utilities, covering areas such as utility operations and financial management.
- Some VEI staff members are stationed at BWB, and a few years ago, there were also VEI-affiliated staff at LWB.
- VEI typically assigns one resident expert to BWB and also dispatches a short-term specialist from the Netherlands to specific regions in Malawi for technical cooperation.

(3) African Development Bank (AfDB)

a) AfDB's engagement in Malawi

- AfDB is not currently providing direct support to either BWB or LWB. Previously, a project proposal for BWB was considered, but given that JICA was already providing support and the World Bank was covering some components, the proposal was put on hold. AfDB remains active in supporting Malawi's water and sanitation sector, particularly through assistance in reviewing and revising the National Water Policy and Sanitation Policy. These policy reforms impact both utilities and private sector entities in Malawi. Over the past four to five years, AfDB has allocated resources to support water and sanitation regulation for the Northern Region Water Utility. AfDB has also implemented support programs for water supply projects in rural areas not covered by BWB or LWB. Given that the World Bank is implementing a larger sector-wide support project, AfDB is currently considering complementary support to fill existing gaps.
- The World Bank's project for BWB does not fully cover all challenges, leaving room for additional support. For example, in Blantyre, an investment plan targeting \$7–10 million in water supply improvements exists, yet the World Bank is covering only \$1.5 million. Investment needs for BWB remain significant.

b) Regulatory framework in the water sector

- The Ministry of Water and Sanitation is attempting to address regulatory challenges, but the lack of a structured regulatory framework remains a major issue for Malawi's water sector. This affects both water utilities and private sector entities. With the World Bank's support, the Malawian government is currently working on regulatory reforms. Regulation is needed to establish service levels, cost recovery mechanisms, and tariff approval procedures for water utilities.
- Water tariffs are not adjusted based on financial performance, making regulation a key challenge. Tariff levels remain insufficient to ensure full O&M cost recovery, which hinders investment. O&M costs are high, and efficiency remains low.

c) Power supply issues

- Previously, LWB's main facilities were managed through three power lines, but the current situation is unclear. However, power outages appear to be increasing. A renewable energy investment project, including solar power for water treatment plants and pumping stations, was considered for LWB. However, the draft results of a feasibility study (FS) conducted with the World Bank's support indicated that electricity from ESCOM remains cheaper than solar power for LWB.

d) Prepaid meters and collection efficiency

- In the Northern Region, collection efficiency from government institutions remains low. AfDB's support for procuring prepaid meters has slightly improved revenue collection. However, many government institutions refused to accept prepaid meters, posing a significant challenge. Despite multiple discussions and proposals, securing government acceptance remains difficult. For instance, in Mzuzu (Malawi's third-largest city), the water supply system in the army barracks suffers from severe leakages and requires rehabilitation. However, financial constraints prevent action from

being taken. Similar issues likely exist in the Central and Southern Regions as well. The installation of prepaid meters in military barracks and state-owned buildings (such as the State House) requires strong government commitment, making implementation difficult.

- Recently, water utilities have raised concerns regarding the relationship between prepaid meter installations and revenue collection from a technical standpoint. Users can control water consumption, potentially affecting utility revenues. There are reports that user-driven consumption adjustments have led to revenue declines in some areas. If prepaid meter installations continue, similar issues may arise. BWB reportedly replaced over 5,000 faulty prepaid meters. For water utilities, the main concern is not water consumption itself but rather revenue stability.
- The government is willing to assist utilities in procuring prepaid meters. AfDB has supported the procurement of 12,000 prepaid meters for Northern Region Water Utilities to improve revenue collection efficiency. Additional procurement was planned but concerns over inaccurate metering and its negative impact on revenue collection have emerged as a significant issue.

(4) VEI (Dutch water utility)

Interviews with project managers responsible for providing assistance to the BWB and the Southern Regional Water Board (SRWB).

a) Overview of VEI

- VEI is a consortium of Dutch water utilities that provides technical cooperation to developing countries. The ten water utilities within VEI operate as independent private companies.
- Support for BWB and SRWB is funded through the Dutch Ministry of Foreign Affairs' Water Utility Program. This program consists of three phases: 2018–2021, 2022–2026 and 2027–2030.
- VEI collaborated with LWB from 2009 to 2021. For BWB, cooperation was conducted from 2009 to 2014 and resumed in 2023. Technical cooperation personnel are dispatched from Dutch water utilities. The focus is on technical assistance, with limited funding for physical infrastructure support.

b) Infrastructure-related technical support by VEI

- The World Bank's NRW support for BWB focuses primarily on physical NRW reduction.
- VEI targets other aspects, including:
 - ✧ Support for water meter management, such as specifications, procurement processes, maintenance, and replacement timing.
 - ✧ Prepaid meters are being promoted, but their short lifespan (around five years) requires careful selection of installation sites. If installed for low-consumption users, cost recovery may be unfeasible. BWB's prepaid meter installation strategy lacks this critical consideration.
- Technical training for water pipeline workers is also being provided. In some cases, pipelines are not buried at adequate depths. Dutch experts were invited to conduct hands-on training.
- Additionally, VEI is supporting commercial NRW reduction, including SOP development and commercial management.

c) Leadership development training for management teams

- A one-week leadership training session is scheduled for February 2025. Participation is limited to the CEO and four directors. In Malawi, top-down management is common, so this training will focus on: Encouraging leaders to listen to team members' opinions and Developing teamwork and collaborative decision-making skills.
- Initially, the CEO of BWB did not recognize the necessity of the training. However, after learning about SRWB's positive experience with the program, the CEO decided to proceed with the training.

d) Other challenges at BWB

- Unclear job descriptions and role definitions within the organization. Challenges in setting performance targets. These are recognized issues, but not within the scope of current support.
- Improving labor cost efficiency remains a challenge. One possible approach is reducing travel allowances.

e) Challenges in Malawi's water sector

- The absence of an independent regulatory body is a major issue.
- Integration of wastewater management is necessary, along with capacity strengthening. Sewerage tariffs should be reviewed independently from municipal tax systems. Sewerage services are not highly profitable. A Department of Sanitation has been established within MWS.
- The creation of a national groundwater database is also required. Support is being provided in collaboration with NWRA.

f) BWB's solar power project considered under an Exim Bank Loan

- High electricity costs remain a significant challenge for BWB. Potential solutions include: Introducing solar power generation and Improving pump efficiency.
- The solar power project under an Exim Bank loan has stalled due to: Exim Bank covering only 50% of project costs, Procurement being restricted to Indian suppliers, and the lack of a co-financer to cover the remaining costs.

3.6. Blantyre Water Board (BWB)

3.6.1. Results of utility analysis

3.6.1.1. Results of analysis after desktop survey and field study

(1) Updated indicators

Table3-11 Key Performance Indicators of BWB

KPI #	KPI	Data (FY2023/2024)	Stage of growth	Trend
	1.Service improvement and more investment			
1	Investment cost (MWK)	6,096,597	-	↗
2	Production capacity (m ³ /day)	123,000	-	→
3	Production (m ³ /day)	91,415	-	→
4	Utilization ratio of production capacity (%)	74%.	-	→

Data Collection Survey on Through Management Improvement Support Based on Cluster Strategy
for Supporting the Growth of Water Utilities (Final Report)

KPI #	KPI	Data (FY2023/2024)	Stage of growth	Trend
5	Continuity of Service (Hrs/day)	22	2	→
6	Quality of water supplied (Compliance rate: %)	86.2	3	↘
7	Water supply pressure (bar)	-1 to 3.0	2	→
8	Leakage ratio (%)	-	-	-
	2.Increased customer base and satisfaction			
9	Population served	1,260,873	-	-
10	Service coverage / Water coverage (%)	87.0	3	→
11	Customer satisfaction (%)	25.2	1	→
12	Water sold (m ³ /day)	49,580	-	Updown
13	Water consumption per capita per day (L/ca/day)	39.3	-	→
	3.Increased tariff revenue			
14	Turnover from sales (MWK)	30,160,723	-	↗
15	Collection ratio (%)	99	4	↗
16	NRW ratio (%)	55.0	1	→
17	Metering ratio (%)	100	4	→
18	Water tariff level (USD/6m ³)	6.09	-	↗
	4.Improved financial management			
19	Accounting system	Accrual accounting	3	→
20	Net income (MWK)	-33,589,025	-	↘
21	EBITDA (MWK)	-28,217,360	-	↘
22	EBITDA margin (%)	-86	1	↘
23	EBITDA margin excl. deferred income (%)	-100	1	↘
24	Total capital operating margin (%)	-17	-	→
25	Operating Profit Margin (%)	-49	1	→
26	Equity ratio (%)	-27	2	↘
27	Fixed long term conformity rate (%)	160	2	→
28	O&M cost coverage ratio (%)	76	1	→
29	O&M cost coverage ratio excluding subsidies (%)	71	1	→
30	Unit cost of water supply (MWK /m ³) (Overall cost including DEP/Water sold)	2,120	-	-
31	Supply price (MWK /m ³) (Turnover from sales/ Water sold)	1,667	-	-
32	Subsidies (MWK)	0	-	→
33	Development Partner grant support (MWK)	2,207,156	-	↗
34	The ratio of subsidies and DP support to turnover	6.8	-	↘
35	Number of staff per 1,000 connections	9	2	→
	GDP per capita (USD)	602.3		
	Inflation rate (%)	28.8		

Note: The bold texts indicate the more significant indicators for determining whether the growth spiral elements are functioning.

(2) Financial statement analysis (FS Analysis)

1) Summary

- BWB has recorded loss before tax continuously at least from 2015. This is because its O&M coverage ratio (excluding depreciation) has been around 70% to 78% for the last four years, leading to continuous net loss. EBITDA has been negative, and it worsened over the last two years due to the increase in currency exchange loss on its foreign currency-denominated borrowings. Exchange losses account for 55% of the deficit in FY2024.
- Total liabilities exceed total assets by 25 billion, indicating severe financial distress. It became positive only in FY2023 due to the capital injection by the government (34 billion MK) for the payment of 23 billion MK to related party payables, mainly to ESCOM. The accumulated losses amount to 98 billion in FY2024.
- The ratio of grant income to total income increased to 7% in FY 2024 from 1% in the previous year.

2) Positive

- The government showed a supportive attitude by capital injection in FY2022/2023.

3) Negative

- The O&M cost coverage ratio has been very low at around 70% to 78% for the last four years.
- Total liabilities exceed total asset by 25 billion, indicating severe financial distress. The accumulated losses amounted to 98 billion in FY2024.
- Long-term loans (current and non-current) in FY2024 increased by 39% (18 billion) to 66 billion over the previous year, mainly due to the unrealized exchange loss (12 billion) on foreign currency borrowings from Exim Bank.

(3) Summary of bottleneck analysis

(Internal Factors)

a) Low water production capacity

- While the estimated demand of 140,000 m³/day, BWB has design capacity of 121,000 m³/day. However, the current production is only 91,400 m³/day due to the reduced capacity of the storage reservoir and deteriorated water treatment plant in Mudi. This production meets only two-thirds of the demand, highlighting low production capacity.

b) High NRW ratio

- The NRW ratio is as high as 55%. A department for NRW management has been established, but the NRW management system is not yet in place. Strategies and plans for NRW measures have not been developed, and sufficient budgets have not been allocated. Therefore, effective activities cannot be implemented, and the NRW ratio remains high. The limited availability of NRW equipment is a major challenge, as only basic tools are available. Currently, leak detection is limited to surface leaks, while 2000 leak cases per month are reported. Illegal connections are key problem contributing to commercial losses. There are a large number of malfunctioning regular (5,600) and prepaid meters (4,765), which need to be replaced. Additionally, aged infrastructure, including 50-year-old asbestos cement pipes needs replacement to reduce water loss and handle pressure fluctuations. This challenge is tackled with the support of the World Bank. BWB is replacing its aged pipes and it is expected that NRW will decrease after its completion. No technical cooperation to reduce NRW is planned.

c) High Operating and Maintenance Costs

- The unit cost of water supply (2,700 MK/m³) is 1.8 times higher than that of LWB (1487 MK/m³). Currently, 46% of the total operating costs are composed of electricity expenses. This is due to the geographical factors of Blantyre City (distance and elevation differences from the water treatment plant), which require a significant amount of electricity for pumping. This high electricity cost is the main cause of high O&M costs, leading to the low O&M cost coverage ratio. Declining pump efficiency is a major challenge, with some pumps operating at only 50% efficiency.
- The World Bank is supporting the renewal of the aging Mudi water treatment plant. The production cost of this water source is much lower than the water source in Walkers Ferry. This will lead to

some reduction of electricity costs.

d) Low collection ratio

- Accounts with unpaid bills for three months are disconnected. As a result of disconnections, there has been an increase in illegal connections and the use of private wells, which is impacting BWB's water sources. Additionally, unauthorized water sellers have emerged. Collection ratio (%) (Collected/ Current billed + arrears) improved from 64% to 77% over the last three years. This low collection rate is due to delayed payment from public institutions. This hampers cash management and the ability of BWB to invest. To address this, prepaid meters are being installed.

e) Need for enhancement of training and efficiency

- While a human resource development plan exists, there are no operation manuals, and the training system is inadequate. New employees learn informally from experienced staff. As a result, this leads to inefficient maintenance. There is a risk that required technical skills are not passed down following the retirement of veteran technicians.

f) Need for mid-term plan for recovery and swift implementation

- Given the financial and operation challenges of BWB, it needs to have a mid-term plan to improve and implement it swiftly. While BWB already created a turnaround strategy, BWB needs to enhance its capacity for planning, implementation, and monitoring of the plan since there are the challenges in many areas.

(External Factors)

g) Difficulty of regular tariff adjustment to reflect cost increase

- O&M coverage ratio (excluding depreciation) has been around 70% to 78% for the last four years, leading to continuous net loss. Since 2018, the tariff has not been revised until 2021. The tariff was revised in November 2022, June 2023 and twice in 2024. However, the water revenue is not at a cost recovery level. In addition, the automatic or regular tariff adjustment is especially needed due to the recent Malawi's high inflation. The lack of an independent regulatory body makes water tariff adjustments difficult.

h) Natural disasters such as cyclones

- The city of Blantyre suffered major cyclone damage in 2022 and 2023. This caused a negative impact on the revenue due to the wavering of some payments from the affected population. In addition, water infrastructure was damaged. While the magnitude of this impact is not clear, it seems some funds are used to repair and reconstruct the damaged infrastructure. It is difficult to reserve funds for such natural disasters at each WB level out of the water revenue.

i) Macroeconomic challenges, especially the high inflation

- Malawi has experienced high inflation and currency devaluation, which have adversely impacted financial sustainability. Without tariff adjustments and improvements in operational efficiency, these economic conditions pose significant financial challenges.

- In addition to that, the Malawi government is undergoing adjustment and reforms, committed under the Extended Credit Facility (ECF) arrangement with IMF. This might be a reason for the change of cash management of WB. The government decided for the WBs to deposit its cash to central bank from April 2025. Those tightening financial management might affect the WBs.

(4) Overall diagnosis of growth spiral

Overall, the spiral is not working well. The production capacity and service continuity remain unchanged. Production meets only two-thirds of the demand. The quality of services, including water quality and supply hours, has not yet shown significant improvement. Despite an increase in capital investment in FY2023/24, its impact has not yet materialized within the same fiscal year. The service coverage remains stagnant, and customer satisfaction is still low.

Turnover increased by 27% from FY2022/23 to FY2023/24, primarily driven by tariff adjustments. The collection ratio has remained stable over the past two years. However, the NRW ratio remains persistently high. The O&M coverage ratio (excluding depreciation) has been as low as between 73% and 79% over the past four years, resulting in continuous net losses. Consequently, its investments are largely funded by development partners, with little to no reliance on internal funds.

Overall, as a first step, improving water supply services and enhancing operational efficiency is essential to initiating a positive spiral of development.

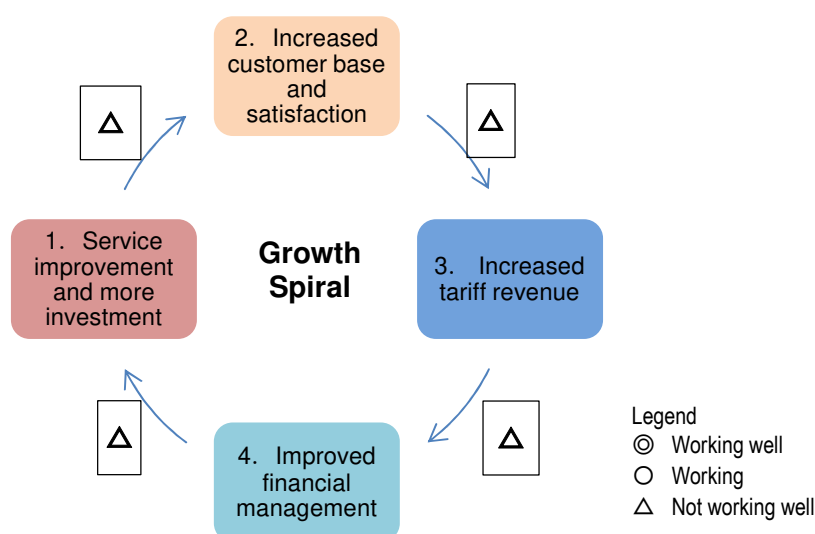


Figure 3-16 Growth Spiral Diagnostic Results (BWB)

(5) Strategic analysis

1) Medium-Term targets and recommendations

In the strategic analysis, higher-level goals that encompass BWB's vision and mission were created. Based on these higher-level goals and considering plans such as BWB's Turnaround Strategy 2024-2027, the mid-term goal necessary for BWB to activate the growth spiral was set.

■ Mid-term goal: " BWB transforms by implementing a well-developed turnaround strategy, primarily focusing on increasing water supply reliability while enhancing financial sustainability through improving operational efficiency"

Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by high electricity costs. The revenue from water sales is negative to cover even basic operation and maintenance (O&M) costs, preventing BWB from achieving service improvements. To address these challenges, BWB has developed a turnaround strategy, with the following expected outcomes:

- Improved operational efficiency
- Improved financial position
- Improved staff productivity
- Improved corporate governance
- Improved water supply
- Improved customer service

A persistently high NRW ratio remains a major challenge, driven by inadequate strategies and limited budgets. To tackle this, strengthening the capacity of the specialized NRW department, formulating targeted strategies, and addressing commercial losses are crucial.

High operating costs, particularly electricity expenses, also pose a significant burden. To alleviate financial strain, BWB plans to replace aged pipes, negotiate electricity cost reductions, and invest in solar power plants. The renewal of the Mudi Water Treatment Plant is expected to enhance water supply reliability.

Inefficient maintenance practices continue to be a critical issue. These can be addressed by developing comprehensive operation manuals and enhancing the training system to facilitate effective technical skill transfer. Furthermore, revisiting and updating the existing human resource development plan is essential to ensuring sustained and effective workforce capacity.

2) Growth steps

The growth steps (phased measures) to activate the growth spiral are shown in the following diagram. The specific measures that can be considered are as follows (the numbers correspond to those in the diagram).

- 1~5 Implement turnaround strategy and strategic plan
2. Replace malfunctioning meters (Enhance NRW management capacity)
3. Rehabilitate Mudi dam and WTP (low-cost water source) to recover a total of 121,000 m³/day design capacity (Improve water production capacity)
4. Intensive DMA management (Enhance NRW management capacity)
5. Modernize network
- 1~5 Reduce energy cost
- 1~5 Revision of water tariff which ensure the cost recovery

(Break-even → Grow)

Other improvement measures

- Improve cash flow management especially by improvement of collection from public institutions
- Human resources development and improvement of efficiency

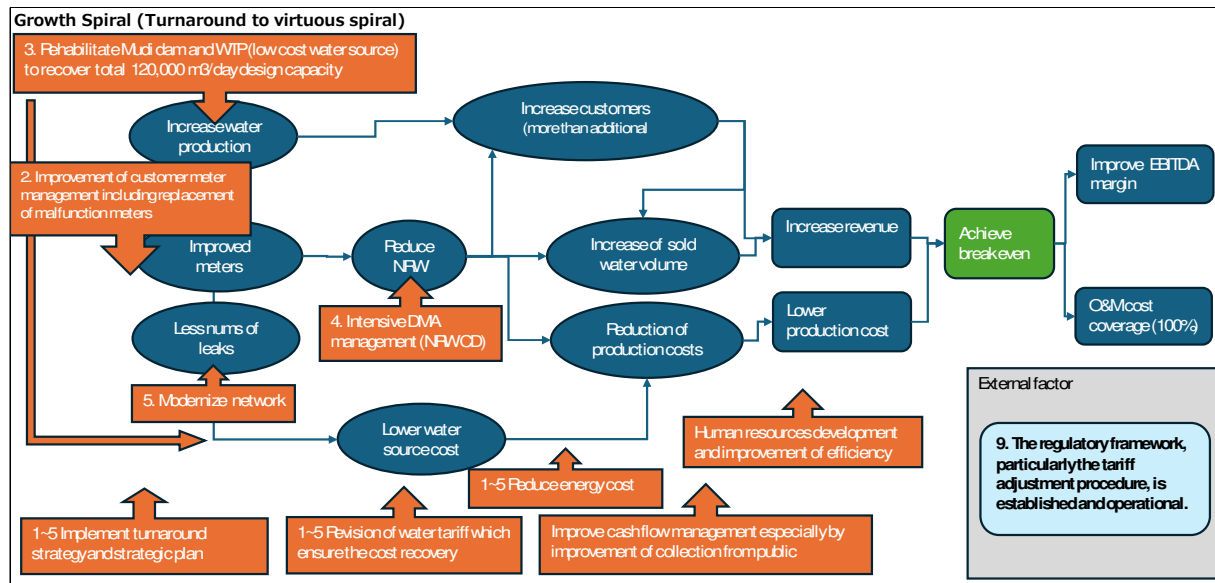


Figure 3-17 Growth Steps (BWB)

3.6.1.2. Possible solutions

(1) Results and activities

Based on the strategic analysis, the necessary outcomes and activities required to activate BWB's growth spiral are outlined below.

1) Internal factors

Outcome 1. Achieve financial recovery by implementing a turnaround strategy and a strategic plan

- 1-1 Assess BWB's implementation capacity for turnaround strategy and a strategic plan
- 1-2 Enhance the capacity of planning, implementation, and monitoring for a turnaround strategy
- 1-3 Enhance the capacity of planning, implementation, and monitoring for a strategic plan

Outcome 2. Improve water production capacity

- 2-1 Develop a master plan for optimal water sources development
- 2-2 Rehabilitation of dam, intake facility and treatment plant at Mudi system
- 2-3 Rehabilitation of intake facility and existing treatment plant at Shire River
- 2-4 Development of new water sources and treatment plant, new transmission mains

Outcome 3. Enhance NRW management capacity

- 3-1 Update NRW strategy and develop NRW management plan
- 3-2 Strengthen NRW management capacity

3-3 Implement NRW management plan

Outcome 4. Modernize and renew water supply facilities (Network and WTP)

- 4-1 Implement priority projects in two zones
- 4-2 Implement a project for the zone that is not covered by the World Bank project
- 4-3 Develop the introduction of SCADA and implement

Outcome 5. Reduce energy cost

- 5-1 Plan energy consumption reduction
- 5-2 Optimize existing plant operation
- 5-3 Development of solar power plant for existing water treatments and pumping stations

Outcome 6. Improve cash flow management, especially by improvement of collection from public institutions

- 6-1 Replacement of pre-paid meter for public institutions
- 6-2 Negotiation to settle the payment of arrears for public institutions
- 6-3 Improve cash management

Outcome 7. Revision of water tariff which ensures the cost recovery

- 7-1 Develop a mid-term financial plan for water tariff calculation
- 7-2 Improve customer satisfaction by introducing an integrated management information system, including the customer relationship management system
- 7-3 Execute tariff study for developing a sustainable tariff model
- 7-4 Engage the customers and the ministry for tariff revision

Outcome 8. Human resources development and improvement of efficiency

- 8-1 Enhance human resources for new facilities such as network and wastewater facility
- 8-2 Enhance capacity for fund mobilization and debt management

2) External factors

Outcome 9. The regulatory framework, particularly the tariff adjustment procedure, is established and operationalized.

- 9-1 Establish an independent regulator, whose function includes tariff adjustment
- 9-2 (The regulator to be established) to develop a standard model of tariff adjustment
- 9-3 (The regulator to be established) Implement regular tariff adjustment

(2) Improvement scenarios

First, implement the activities for Outcome 1. Then, by carrying out the activities for Outcomes 2, 3, 4, 5, 6, and 8, the efficiency of operations and maintenance will be improved. In parallel, by implementing the activities for Outcome 7, financial sustainability will be enhanced, aiming to achieve the mid-term goal. Additionally, by addressing the external factors in Outcome 9, improvements in the water sector will contribute to achieving the mid-term goal. The improvement scenario for BWB, based on the

outcomes and activities, is as follows.

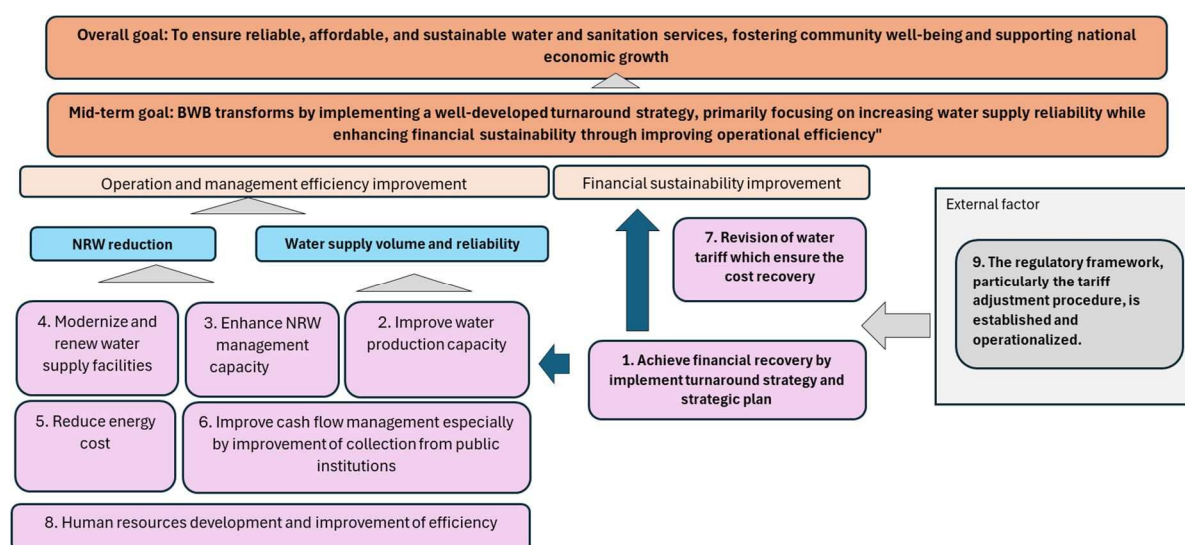


Figure 3-18 Improvement Scenarios (BWB)

3.6.2. Details of discussions with utility

3.6.2.1. First field survey

(1) Meeting counterpart

Since the BWB's CEO was not present at the time of the field survey, an executive briefing meeting was held, chaired by the head of the technical services, and attended by the heads of the finance department, water distribution and customer service department, human resources and general affairs department, and project implementation unit personnel, to explain the analysis results of diagnosis and solutions.

(2) Comments on the analysis results and recognized challenges by utility

a) Comparison between BWB and LWB cost structures

By comparing the two companies, it is clear that the high cost of electricity is the main factor contributing to BWB's high operating costs.

b) Decreased water supply capacity and shortages

Due to a lack of water resources, BWB has been unable to respond to more than 10,000 connection requests.

The existing Mudi dam was constructed in 1955 and has not been dredged since then, which has caused it to become shallower and its storage capacity to decrease due to the accumulation of silts. Dredging and raising the embankment is necessary to restore the dam capacity. However, this is difficult due to the presence of a railroad in the vicinity. The intake building has three levels of intakes, but as of December 2024, the lowest intake deteriorated to the point that it is no longer visible. The amount of water resources is decreasing, but the capacity of the water treatment plant itself is also declining and needs to be rehabilitated. Due to the deterioration of water quality, sand for filtration needs to be changed

every year, which is also costly.

The water treatment plants within BWB's headquarters originally supplied 40% of the total water volume, but the volume has been decreasing. The rest is Shire River (80,000~90,000 m³/day) and Nguludi water treatment plant (Likhubula river) 20,000 m³/day. Currently, Shire River is 80% and Nguludi 20%. Water quality in the Shire River is deteriorating due to sedimentation.

The Walker's Ferry water treatment plant was built in 1964 at the same time as the dam and hydroelectric power generation. The water depth at the intake was 12 m. In addition to the accumulation of silt in the intake, the intake pump broke down frequently, once every week or two, due to silt being sucked in. There was also a dredge machine, but it was damaged by the cyclone. During the rainy season, the level of turbidity can be as high as 3,000 NTU. Normally, 2 drums of chemicals are used per day, but during the rainy season, 8 drums are used. The site is located 40 km from the city. A two-stage pump delivers water to the city at a head of 400 m each.

While the Shire River system supplies 80% of the water volume, the treatment plant cannot handle the increased mud during the rainy season. This leads to shutting off the supply from the treatment plant. Turbidity levels can reach 13,000 NTU.

Current water supply hours are 16~18 hours/day in some areas. During the rainy season, power outages are frequent, affecting the water supply.

A feasibility study is being conducted on a new dam as a water source development. This new dam will reduce the water supply from Walker's Ferry, thus reducing electricity costs.

c) High NRW ratio

The company is working toward its goal of reducing the NRW ratio to 50% by FY2024/2025. Prepaid meters were installed in 2017 to address delays in payments by public agencies, which resulted in lower revenues. The World Bank project is supporting the replacement of water meters in two zones (Kabula and Soche) as the reason for this is believed to be under-reading by prepaid meters. The remaining one zone, Linbe, is a problematic zone and requires the replacement of old pipes, etc. A total of 32,000 prepaid meters were installed, out of which 8,000 have been replaced, and 24,000 remain unreplaced.

The replacement of water pipes by the World Bank project is scheduled to begin in FY2025/2026 and to be completed in 2029, with priority given to locations with high demand.

Currently, there is only one excavator, which is broken. Therefore, excavation is done either by manual excavation or procured through an outside contractor. It is necessary to have an excavator in each of the three zones. It was decided to utilize staff since the NRW measures are an ongoing task and staff capacity building is necessary. Equipment for NRW measures is an issue, as only simple tools are available. In addition, only surface leaks are found. The number of leaks is as high as 2,000 cases per month.

d) High O&M costs

The cause of the higher O&M cost is the electricity cost of USD 2.1 million per month. As a result of

negotiations with ESCOM on electricity tariff, a reduction has been applied starting in September 2024 as a special arrangement. Other ways to reduce electricity costs include the use of solar power generation and the use of pumps with better efficiency to reduce electricity consumption.

e) Low collection rate

Users whose bills remain unpaid for more than three months are supposed to be disconnected, but this has resulted in an increase in illegal connections and the use of private wells, affecting BWB's water sources negatively. In addition, unlicensed water vendors have emerged.

It is the public agencies that have been lowering the collection rate. To address this, BWB is installing prepaid meters. Another challenge is that although the Treasury of the national government on behalf of each public agency is now paying BWB by a promissory note, this has a maturity of 12 months for payment, so there is a fee of approximately 20% at the bank to cash it before the maturity.

f) Low customer satisfaction

The satisfaction level of customers according to the satisfaction survey conducted in 2024 varied between 19% to 24%. The customer satisfaction survey indicates that the long response time to inquiries is a particular issue. There are also issues with the reporting system when inquiries are received from customers, and there is a need to systematically provide instructions to the responding plumber. To solve this challenges, a Customer Relationship Management system is planned to be introduced. This will connect data of call centers, to billing data, etc.

The customer centers handle payments and other procedures and currently have six locations, which will be improved with the construction of two customer centers in remote and newly expanded areas. It will also improve its services by promoting digitalization. On the other hand, the staff at the customer centers do not know the reasons for the issues or the water system, so they are unable to provide appropriate answers to customers.

It is also necessary to sensitize customers that some of the factors that may cause the water supply to stop include power outages caused by ESCOM and the depletion of water sources.

g) Human Resource Training Needs

There is a 5-year human resource development plan, but currently, there is no well-developed training system, so the staff skills are being built through on-the-job training. While there are skilled workers, there are no trainers. Thus, the challenge is how to train younger staff. A facility to conduct training is also needed. The challenge is to train young people to replace retirees.

BWB has more work performed by internal personnel than LWB, although some work is outsourced. It plans to increase the number of connections in the future, and reduce the staff per 1,000 connections to 6.

h) Implementation of a mid-term plan for business improvement and strengthening of business management

BWB is moving forward with the creation of a turnaround strategy and improvement plan. In addition,

a Strategic plan 2026–2030 is being developed and will be finalized by the Board in February or March 2025.

There is a scheduled debt restructuring and capital injection (Debt restructuring) with the government of Malawi starting FY2025/2026 to improve financial soundness, and a decision to apply special rates with ESCOM, the power company.

In the World Bank project, a Performance-based Partnership Contract (PPC) is being implemented (2023-2024), which also includes as targets NRW reduction, customer satisfaction index, and reduction of staff per connection. Through the review of the first year's results, the NRW target was removed and an indicator on energy efficiency was added, as many targets were not met.

The regularity of cash overdrafts was pointed out as the problem of cash management.

i) **Water tariff and the need for a regulatory agency**

After 2018, water tariffs were frozen until 2021 against the backdrop of the elections. Water tariffs were revised twice in November 2022, June 2023, and 2024. However, revenues still have not reached a cost-recovery level. Therefore, a water tariff model and an independent regulatory agency are needed. There is no model for calculating water tariffs, only a formula for calculating the required revenues. The lack of a regulatory agency is a contributing factor to this situation.

j) **Need for government support for cyclones and other natural disasters**

Blantyre City suffered major cyclone damage in 2022 and 2023. The landslides caused damage to water facilities such as spills of water pipes, etc. Temporary measures were taken by borrowing from local banks. However, another cyclone would be a problem. BWB also distributed water for free to the affected residents as support.

(3) Reactions and views of utility executives on solutions and approaches

Interest in analyzing KPIs and making comparisons with other water utilities was confirmed. There was general agreement on the need to address high NRW and improvement of collection rates.

(4) Action plan

The action plan was to share financial restructuring plans and other documents.

Table3-12 Action Plan (BWB)

No.	Materials	Received or not
1	Ongoing project data	
2	Future project list	
3	Population served	
4	Annual report for the financial year ending June 2024	Received
5	Financial analysis of budget and actual for FY2023/2024	Received
6	Financial recovery and sustainability plan august 2024 to July 2025	Received
7	Turnaround strategy 2024-2027 (May 2024)	Received
8	Signed financial statement of last year	Received
9	Letter on Debt restructuring proposal	Received

No.	Materials	Received or not
10	Water Pressure	
11	Water sold (m ³ /day)	
12	Assessment report of impact of pre-paid meter	
13	NRW strategy	
14	NRW Roadmap	
15	Quarterly reports including NRW, collection rate, customer query.	
16	IWA Water balance	
17	Customer query quarterly report	
18	customer satisfaction survey report in 2024	Received
19	Training needs assessment report	Received

(5) Executive awareness of problems and willingness to improve the organization

Although the CEO was not available to discuss the project, the directors of each department were highly motivated to make improvements, as they shared a common understanding of the challenges among their respective departments and were working on the management restructuring plan. This may be partly due to the fact that part of the Bank's project support was contingent on the achievement of KPIs.

The JICA Study Team evaluated the executives' leadership, enthusiasm, and commitment to reform using the four items listed below on a four-point scale (4 being the highest rating and 1 the lowest).

Item	Contents	Evaluation
1. Issues	Are you aware of the organization's problems?	3 Although the problems have been identified, prioritization of improvements is still underway, and the importance of the problems has not been fully understood.
2. Taking initiative with a goal	Do you have a clear goal or vision for your current job?	2 Executives are working by presenting their vision and mission in annual plans and other documents.
3. Attitude towards political pressure	How will you deal with political pressure in the course of your work?	2 As a national agency, they assess the situation and respond accordingly while working with government ministries and agencies.
4. Efforts to improve business efficiency.	Have you implemented any specific measures to improve business efficiency?	3 Management reforms have been initiated with support from the World Bank and efforts are being made to work with the ministry to implement them.

(6) Comparison with desktop survey results

The results of the field survey revealed that improvement efforts are underway through turnaround strategy and other measures with regard to the issues identified as bottlenecks. In addition to the bottlenecks of the diagnostic report prepared during the desktop survey, it was found that the decrease in water volume and deterioration of water quality in the water source were a major issue. During the first field survey, the JICA Study Team was able to identify additional documents such as turnaround strategy, which allowed us to base our analysis of the diagnostic and solutions report on more recent information.

3.6.2.2. Second field survey

(1) Meeting counterpart

During the second field study, a meeting with the CEO was scheduled. However, the CEO had to attend the parliament on short notice, so meetings were held with the director of technical services, the director of water distribution and customer service, and the director of finance.

(2) Challenges perceived by BWB

a) Improvement of Mudi system

The initial design capacity of the Mudi system was 40,000 m³/day but the current average is 9,000 m³/day and 0 to 8,000 m³/day in the dry season. Even before 2015, production was less than 10,000 m³/day due to problems in the watershed area. Improvements are needed to overcome this.

b) Electricity Cost Reduction Measures

The implementation of a special agreement with ESCOM will reduce electricity costs (800 million MK per month). In addition, BWB is considering replacing pumps with more energy-efficient ones and installing photovoltaic systems at treatment plants and pumping stations.

c) Measures to increase revenue

Measures to increase revenue are planned such as improving fee collection, working to improve delinquent payments by government agencies, improving collections by involving debt collectors, incentivizing debt collectors to improve water fee collections, and introducing additional fees for late payments.

d) Items to be considered in the strategic plan

A strategy plan starting in 2025 is still being developed. The political support for additional well drilling is also an issue.

e) Water Rates and Costs

High inflation of approximately 34% has resulted in higher costs. Against this backdrop, the Ministry of Water only approved a 10% increase in water rates in 2024, although BWB applied for a 30% increase.

Affordability study of water tariff (conducted in November 2024) found that water tariff are considered low. However, the lack of an independent agency makes it difficult to raise water rates.

f) Matters requiring special support

- detailed design and project supervision of bwb network renovation
- Pipeline and meter replacement
- Reservoir construction

(3) Reactions and views of utility executives on problem-solving approaches (solutions)

Although BWB has identified the following six initiatives in its turnaround strategy, BWB managements said that it is unable to indicate priorities at this time because BWB is considering priorities from among

these initiatives through the World Bank-supported study.

- Improvement of management efficiency
- Improved financial position
- Improve personnel efficiency
- Improving corporate governance
- Improved water supply
- Improved customer service

3.6.3. Details of discussions with other organizations

This is described in 3.5.2 and 3.5.3, collectively with LWB.

CHAPTER 4 : PROPOSED TECHNICAL COOPERATION

4. Proposed Technical Cooperation

4.1. Metro Cebu Water District (MCWD)

4.1.1. Background

In the Metro Cebu region, MCWD, a publicly operated water utility, plays a key role in providing water supply services to eight cities and municipalities, which constitute the country's largest water supply area.

MCWD has achieved an average supply duration of approximately 22 hours per day, while also attaining cost recovery solely through water tariff revenues, including infrastructure development costs. Additionally, MCWD has accumulated internal reserves and supplies water at 24 PHP/m³, making it the lowest water tariff in the country.

The region faces limited available water sources. Groundwater extraction is approaching the permissible limit, and surface water sources, including rivers, are highly susceptible to El Niño and other climate impacts, with reports of significant reductions in water intake during the dry season.

To address this situation, in the short-term MCWD is considering agreements with private water suppliers operating seawater or brackish water desalination plants (reverse osmosis (RO) plant), while in the medium to long term, it plans to develop river water sources located far from the service area. The high cost of purchasing treated water from private suppliers imposes a financial burden, prompting MCWD to explore the development and operation of its own RO plants.

Infrastructure expansion requires loans from government banks, but lengthy approval processes from the regulatory body, LWUA, as well as permit acquisitions for project activities from LGUs, have delayed progress. Furthermore, water tariff increases have not been revised for approximately 10 years. The key constraints are listed below (see Chapter 3 for details).

(Internal Factors)

- Increasing costly water resources and less potential for development of water resources
- Degradation of groundwater and increasing connection request
- Infrastructure limitations
- Increasing NRW
- Training needs
- Lack of development funds

(External Factors)

- Limited funding
- Regulatory fragmentation
- Delay of tariff adjustment by LWUA
- Limited financing support
- Limited support and collaboration/coordination with political and government administrations (LGUs, DENR, DPWH, and NWRB)

- Unregulated groundwater resource development and management
- Limited resilience to climate change & disasters

4.1.2. Proposed technical cooperation

(1) Advisory work for Climate Change Adaptive Water Supply Planning in the Metro Cebu Water District

1) Project objective While the management and financial situation is relatively stable, challenges remain in securing water sources and financing their development. Therefore, support will be provided for the formulation of plans aimed at sustainable and diversified water source development and financing.
2) Cooperation scheme Individual experts (about 3 experts)
3) Impact Stable water supply in the Metro Cebu area to cope with climate change.
4) Project purpose A water supply management plan and a financing plan will be formulated based on water resource management, water source diversification, water demand management, and efficient water utilization.
5) Outcomes 1: Assess the status of existing water sources, water demand, potential water sources, and water utilization, and formulate a long-term, climate-resilient water supply plan that addresses future demand, incorporating a cost-effectiveness analysis. 2: Develop a NRW reduction plan and enhance NRW management capacity through training programs. 3: Identify and integrate appropriate financing mechanisms into the water supply plan to support the implementation of various measures. 4: Develop a staff capacity-building and training plan utilizing the training facility and conduct practical capacity-building training related to NRW management as part of Outcome 2.

(2) Metro Cebu Water District Water Use Efficiency Promotion Project

1) Project objective Given the challenges in securing water sources, including (1) difficulties in maintaining continuous water service, especially during the dry season, and expanding the water supply network, and (2) high costs of purchasing water from private suppliers, this project aims to support MCWD's capacity to operate its own seawater desalination (RO) plant, while also improving distribution management including water pressure control to reduce NRW due to leaks. By doing so, the project seeks to ensure a stable water supply at a lower cost while promoting the efficient use of limited water resources.
2) Cooperation scheme Technical Cooperation Project / Thematic Training
3) Impact Stable water supply in the Metro Cebu area.

4) Project purpose

MCWD's water use efficiency will be improved.

5) Outcomes

- 1: The ability to efficiently plan and operate diverse water sources, including seawater desalination plants, will be improved.
- 2: NRW management capacity, including water distribution management capacity, will be improved.
- 3: A pilot introduction of smart meters will be implemented to support the development of a demand management plan.

(3) Advisor for Resilience Enhancement and Policy Coordination, Metro Cebu Water Utility

1) Project objective

To enhance the sustainability and resilience of the water supply sector in the Metro Cebu region, the project will establish a regulatory and policy support framework, facilitate coordination and collaboration with relevant government agencies, and support the formulation of a resilience plan, including climate change adaptation measures, as well as the coordination of development partner (DP) support.

2) Cooperation scheme

Individual experts (a shuttle-type dispatch of a few experts)

3) Impact

In the Metro Cebu region, regulatory frameworks and coordination mechanisms with local governments will be strengthened, ensuring sustainable water supply adapted to climate change.

4) Project purpose

Collaboration with regulatory authorities and local governments will be strengthened, a resilience plan will be formulated, and coordination of development partners (DP) support will be facilitated, ensuring sustainable water resource management.

5) Outcomes

- 1: Facilitation of water tariff adjustments: the implementation of appropriate tariff settings will strengthen the financial foundation of the water supply sector.
2. Promotion of financial mobilization: the regulatory authority will facilitate financial mobilization, ensuring that necessary funding is secured.
3. Enhanced coordination between regulatory authorities and local government agencies: strengthened cooperation and coordination will improve the consistency of water resource management.
4. Formulation and implementation of resilience plans for climate change and disasters
5. Coordination of DP support by the national government: technical and financial assistance will be enhanced through improved DP coordination.

4.2. Solomon Water Authority (SIWA)

4.2.1. Background

In the Solomon Islands, the operation of urban water supply and sanitation services is managed by SIWA. As of 2023, the water supply coverage rate stands at 74%, and while this is somewhat limited, the average daily water supply duration reaches 23 hours, indicating that water supply services have achieved a certain level of quality. However, due to high electricity costs typical of island nations and a high NRW ratio of approximately 60%, water tariffs exceed 10% of the average household income. Furthermore, water tariffs have been increased almost annually, placing a significant financial burden on households. The high NRW ratio can be attributed to three main factors:

- (1) Significant elevation differences within the service area, leading to localized high-water pressure exceeding 100 meters in certain areas.
- (2) Aging infrastructure, which contributes to physical water losses.
- (3) An increase in illegal connections, exacerbating commercial losses.

To address factors (1) and (2), JICA implemented "The project for improvement of NRW reduction capacity for Solomon Islands Water Authority" from October 2012 to June 2016 as a technical cooperation project. This project involved: developing an NRW reduction plan and conducting on-the-job training (OJT) for water pressure management and NRW reduction activities within pilot DMAs. However, the target NRW ratio of 25% by 2025, set at the time, has not been achieved. Additionally, the current institutional structure does not fully support comprehensive NRW reduction, as physical losses and commercial losses are managed by separate departments. In fact, NRW has been increasing in the recent years.

One of the key factors contributing to this increase is (3) the rise in illegal connections. SIWA has conducted very few customer surveys, including assessments of residents' ability and willingness to pay. As a result, water tariffs are not set based on affordability and follow a uniform increasing-block tariff structure based on usage levels.

To improve the bill collection rate, which stood at approximately 80% before 2020, SIWA has actively introduced prepaid meters and enforced disconnections for customers with overdue payments. However, this has led some residents, who have limited alternative water sources, to resort to illegal connections. To address these challenges, SIWA, under the leadership of the current CEO, is promoting customer-oriented management reforms. Technical assistance is needed to support the implementation of these reforms.

The key bottlenecks are listed below (see Chapter 3 for details).

(Internal Factors)

- Unknown customer satisfaction
- Increase in illegal connections due to strict enforcement of disconnections
- High water bills due to continuous tariff increases
- High NRW

- Physical loss (Aging infrastructure)
 - Commercial Loss
 - Organizational Challenges
 - Technical and Operational Constraints
 - Less human resources capacity development
- (External Factors)
- High turbidity problem in raw water in heavy rain
 - Potential collaboration and coordination activities with key stakeholders

4.2.2. Proposed technical cooperation

(1) Advisor for Management Promotion, Solomon Water Authority (Customer Oriented)

1) Project objective Promote customer-oriented management by assessing customer satisfaction and implementing a tariff structure based on customers' willingness and ability to pay. This approach aims to reduce illegal connections, expand SIWA's customer base, improve revenue generation, and enhance residents' access to water services, thereby creating a mutually beneficial growth spiral.
2) Impact Residents' access to water services will be improved.
3) Project purpose The ability to operate a customer-oriented business will be strengthened.
4) Cooperation scheme Individual Expert
5) Outcomes 1: The capacity for customer-oriented business operations is strengthened. 1-1 Understand the level of customer satisfaction and assess their needs and expectations. 1-2 Develop a customer-oriented service plan to enhance service delivery based on identified needs. 1-3 Strengthen the institutional framework for implementing customer-focused management. 1-4 Enhance customer-oriented services through continuous improvement and customer engagement. 2: Water tariff adjustment 2-1 Develop a roadmap for tariff setting, considering customers' ability to pay and NRW reduction. 2-2 Set water tariffs based on the established roadmap. 2-3 Implement the roadmap to ensure effective tariff adjustments.

(2) Advisor for NRW Management, Solomon Water Authority

1) Project Objective Strengthen comprehensive NRW reduction measures and implementation capacity by addressing NRW, the main bottleneck in the growth spiral, particularly illegal connections, which have been a key factor in its increase. This will include improving distribution and water pressure management capabilities, establishing a structured training system, and enhancing NRW reduction frameworks.

By increasing revenue and improving residents' access to water (e.g., through potential tariff reductions), a mutually beneficial growth spiral will be fostered. Additionally, lessons learned and expertise from Okinawa and other island nations will be leveraged to build local networks. Through these efforts, NRW reduction will be promoted, contributing to the provision of sustainable water services.
2) Impact Residents' access to water services will be improved.
3) Project purpose Capacity to implement comprehensive NRW control measures will be strengthened.
4) Cooperation scheme Individual expert
5) Outcomes 1: Implementation of NRW management 1-1 Develop a NRW management plan based on experience of the previous JICA project. 1-2 Strengthen comprehensive NRW management capacity (especially commercial loss reduction) through the implementation of the NRW Management Plan. 2: Establishment of a training system 2-1 Review current organizational reform and transformation plans and assess current human resource capacity. 2-2 Develop a human resource development and training plan. 2-3 Implement the human resource development plan.

(3) Solomon Water Authority Customer-Oriented Improvement Comprehensive Plan Study

1) Project objective Develop a comprehensive customer-oriented plan for SIWA, including customer satisfaction improvement based on customer satisfaction surveys, distribution and NRW management, training management, and water source management (water quality improvement). Additionally, formulate a concrete roadmap for improvement.
2) Impact Residents' access to water services will be improved.
3) Project purpose A comprehensive plan for customer-oriented management is developed.
4) Cooperation scheme Study team
5) Outcomes A comprehensive customer-oriented improvement plan is developed.

4.3. Madagascar Electricity and Water Authority (JIRAMA)

4.3.1. Background

Madagascar is highly vulnerable to natural disasters, particularly cyclones, and ranks among the top five countries most affected by climate change. The national electricity and water supply services are managed by the state-owned utility (JIRAMA). As of 2023, the water supply coverage rate stands at 55.9%, and the average daily water supply duration varies significantly by region, ranging from 2 to 16 hours, indicating that the overall level of water service remains low.

Approximately 90% of JIRAMA's revenue comes from electricity services, while water services account for only 10%. Both sectors are operating at a significant level of deficit, failing to cover even basic O&M costs. Additionally, since electricity and water services are not accounted for separately, it is difficult to accurately assess the financial situation of the water sector, and revenues from water services are not exclusively allocated to water-related expenditures. Furthermore, no major investments have been made in the past 20 years, resulting in insufficient development of water infrastructure (based on findings from EIB interviews). Under these circumstances, JIRAMA's growth spiral is not functioning in all aspects, and the following factors are considered major bottlenecks (see Chapter 3 for details).

(Internal Factors)

- Financial difficulty
- Management challenges in both electricity and water services
- Lack of detail mid to long-term recovery plan
- Significant deficit in water supply capacity resulting in low coverage
- Continuously high NRW ratio
- Need for enhancement of human resource

(External Factors)

- No cost-recovery level tariff due to the absence of tariff revisions for many years
- Insufficient regulatory function and organizational capacity leading to low governance of water sector
- Inconsistent electric power supply

4.3.2. Proposed technical cooperation

(1) JIRAMA Water Supply Management Sustainability Improvement Project

1) Project Objective

In the initial phase, a comprehensive reconstruction plan focusing on the capital and major cities will be formulated, with support provided for its implementation.

In October 2024, JICA signed a Grant Agreement (G/A) with the Government of Madagascar for "The Project for the Expansion and Improvement of Water Supply System in Toamasina." This project is scheduled for completion in April 2027. Based on this, technical cooperation will be provided to JIRAMA headquarters and the Toamasina branch—selected as a pilot project site—prior to the

completion of the grant project. This aims to maximize the impact of the grant project and create nationwide synergies from its outcomes. Additionally, since the World Bank is implementing comprehensive financial and technical cooperation for JIRAMA, and the European Investment Bank (EIB) is also providing financial and technical support, efforts will be made to generate collective impact through collaboration between JICA, the World Bank, and EIB.
2) Impact Improve the service and sustainability of JIRAMA's water services
3) Project purpose Based on the comprehensive reconstruction plan implemented by the World Bank, a pilot project will primarily focus on the Toamasina region, strengthening JIRAMA's operational efficiency and financial management capacity, thereby enhancing the sustainability of the water supply sector.
4) Cooperation scheme Technical cooperation project
5) Counterparts JIRAMA (Headquarters and Toamasina Branch)
6) Outcomes
1: JIRAMA's water supply reconstruction plan is formulated and implemented. 1-1 Review JIRAMA's water supply reconstruction plan. 1-2 Develop a roadmap for setting and achieving medium-term technical and financial targets for each branch based on the reconstruction plan. 1-3 Establish an incentive mechanism to promote target achievement, incorporating results of Outcome 2. 1-4 Strengthen the headquarters' monitoring system for operational performance indicators of each branch and establish a follow-up mechanism for annual and medium-term targets.
2: Operational efficiency at the Toamasina Branch (pilot area) is improved. 2-1 Identify key challenges affecting the impact of the JICA grant project, "The Project for the Expansion and Improvement of Water Supply System in Toamasina" 2-2 Develop a concrete action plan for improving operational efficiency and financial management to achieve annual and medium-term targets, based on findings from 2-1. 2-3 Implement priority initiatives (e.g., NRW reduction, improvement of revenue collection rates) based on the action plan to enhance operational efficiency. 2-4 Develop and implement a training plan necessary for executing the action plan, and strengthening capacity. 2-5 Enhance capacity for efficiently preparing monthly and annual reports by utilizing technical and financial performance indicators. 2-6 Compile best practices, lessons learned, and achievements from operational efficiency and management improvement efforts in Toamasina.

(2) Water Sector Sustainability Advisor

1) Project Objective This work aims to support the improvement and sustainability of water services by enhancing the capacity of the regulatory authority in the water sector. The work will facilitate the planning and implementation of water infrastructure investments and support the development of a tariff system that enables such investments.
2) Impact

Governance in Madagascar's water sector will be improved.
3) Project purpose The budget execution capacity of the Ministry of Water, Sanitation, and Hygiene (MEAH) will be strengthened, along with the regulatory functions of SOREA and ANDEA, leading to improved service delivery and sustainability in the water sector.
4) Cooperation scheme Individual experts (it is assumed that experts in each field will be dispatched on a short-term basis under the work implementation contract)
5) Counterpart Ministry of Water and Sanitation (MEAH), SOREA, ANDEA
6) Outcomes 1: Regulatory capacity of SOREA and ANDEA in the water sector, with a focus on JIRAMA is strengthened. 1-1 Review the current status of regulatory institutions, identify areas requiring improvement, and support the development of a roadmap. 1-2 Support the development of guidelines outlining the process for water tariff adjustments, ensuring public understanding and acceptance. 1-3 Assist in evaluating an appropriate water tariff level and structure for JIRAMA. 2: The water sector management capacity of the Ministry of Water and Sanitation (MEAH) is strengthened. 2-1 Review the current state of administrative management in the water sector, identify areas for improvement, and support the development of a roadmap. 2-2 Develop a financing strategy to mobilize funds for large-scale investments. 2-3 Strengthen institutional capacity within MEAH to ensure improved governance and the effective implementation of investment plans.

4.4. Blantyre Water Board (BWB)

4.4.1. Background

Blantyre Water Board (BWB) is responsible for providing water supply services to Blantyre, the commercial hub of Malawi, and its surrounding areas. To finance infrastructure investments, BWB receives on-lent loans from international institutions through the Government of Malawi, making debt repayment a significant financial burden. While the estimated water demand is 140,000 m³/day, BWB's designed production capacity is only 121,000 m³/day. Moreover, due to water source depletion and deteriorating water quality, the actual production capacity has declined to approximately 90,000 m³/day. To secure sufficient water supply, it is essential to restore water sources, increase production capacity, and reduce NRW.

BWB has been running at a financial deficit since at least 2015. The primary reason is the high electricity costs associated with the high pumping requirement due to elevation differences between water sources and BWB's service area. BWB's electricity cost per cubic meter of water sold is 6.9 times higher than that of Lilongwe Water Board (LWB). Additionally, NRW remains high at 55%, caused by:

- Leakages from aging pipelines

- Commercial losses due to illegal connections
- Defective prepaid meters
- Billing and metering issues

Furthermore, water tariff adjustments have been irregular, occurring in 2017, 2022, 2023, and 2024, and the current tariff level does not achieve cost recovery. Since 2023, inflation has surged, making regular adjustments to cost-recovering tariffs essential.

Due to these challenges, customer satisfaction with BWB services was only 25% (based on a 2022/2023 survey), and there are over 10,000 pending connection requests.

To address these issues, BWB has developed a business improvement strategy, aiming to enhance the situation by 2027. Additionally, the World Bank has launched a project focused primarily on BWB, supporting its reform efforts. This project allocates grants based on achieving key performance indicators (KPIs), such as reducing electricity consumption, to provide incentives for improvement. The total budget for this project is \$145 million USD.

Currently, an assessment is underway to identify priority investments, with the World Bank expected to support part of these efforts. Under the reform support from the World Bank, BWB has negotiated a special electricity tariff with the state-owned power company, ESCOM, which has been effective since September 2024, leading to anticipated reductions in electricity costs.

Additionally, the Ministry of Finance has approved a debt restructuring plan regarding foreign exchange losses incurred in March 2024 from Exim Bank's foreign currency-denominated loans, ensuring that such losses will no longer occur in the future. The key bottlenecks are outlined below (see Chapter 3 for details).

(Internal Factors)

- Low water production capacity
- High NRW ratio
- High Operation and maintenance costs
- Low revenue collection ratio
- Need for enhancement of training and efficiency
- Need for the mid-term plan for recovery and swift implementation

(External Factors)

- Difficulty of regular tariff adjustment corresponding to reflect cost increase
- Damage due to natural disasters such as cyclones
- Macroeconomic challenges, especially the high inflation
- Malawi has experienced high inflation and currency devaluation, which have adversely impacted

Since the World Bank is currently implementing comprehensive support through the 'Water and Sanitation Project' (2023–2029) to address key bottlenecks, it is necessary to consider effective support while avoiding overlaps.

4.4.2. Proposed technical cooperation

(1) BWB Management Improvement Capacity Project

Project Objective The World Bank's "Water and Sanitation Project" is implementing comprehensive support with a budget of \$145 million USD, covering key areas such as water source restoration, water treatment plant rehabilitation, and NRW measures (pipeline replacement). Additionally, the project has set KPIs related to improving energy efficiency, providing incentives for achieving these targets. Building on this support, the Malawian government is also advancing improvement efforts, including the introduction of a special electricity tariff by the state-owned power company, ESCOM, effective from September 2024, to reduce electricity costs. Furthermore, regarding the foreign exchange losses incurred in March 2024 due to foreign currency-denominated loans from Exim Bank, the Ministry of Finance has approved a debt restructuring plan, ensuring that such losses will no longer occur in the future. Based on these developments, JICA's support must complement the World Bank project to maximize its effectiveness. The World Bank is currently conducting a study to prioritize ongoing projects and initiatives, and its findings will guide future implementation. Therefore, a two-phase approach is recommended, allowing JICA's support to flexibly adjust and supplement the World Bank project. Additionally, BWB faces infrastructure investment challenges, including high NRW, electricity costs, and water source shortages. However, infrastructure investment has been significantly constrained over the past four years, highlighting the need to promote investment. Given this, a combination of financial cooperation approaches is desirable.
1) Cooperation scheme Technical cooperation
2) Impact Improved water supply services and enhanced financial sustainability of BWB
3) Project purpose Sustainable operational capacity through the implementation of the business improvement strategy is strengthened.
4) Outcomes 1: Enhanced capacity for developing and implementing business improvement strategies and strategic plans, leading to sustainable management 1-1 Review the Business Improvement Strategy 2024–2027 (Turnaround Strategy) and the Five-Year Strategic Plan FY2025/2026–2030/2031 (Strategic Plan) and develop detailed annual plans to achieve the set technical and financial targets. 1-2 Improve the ability to conduct budget and performance management (PDM) for annual KPI achievement including problem analysis. 2: Improved operational efficiency, including NRW reduction 2-1 Enhance the capacity to update the NRW management strategy and develop and implement an NRW management plan. 2-2 Strengthen the ability to develop and implement strategies for improving revenue collection rates. Note: This outcome will utilize activities, manuals, and SOPs developed and implemented at LWB. 3: Promotion of efforts for appropriate water tariff setting 3-1 Analyze challenges based on customer satisfaction surveys, develop an action plan for improving satisfaction, and implement prioritized activities. 3-2 Conduct a study on water tariff adjustments and formulate an adjustment policy. 3-3 Calculate sustainable water tariffs based on a medium-term financial plan that includes loan repayment considerations.

- 3-4 Propose a water tariff adjustment process to the Ministry of Water and Sanitation, engaging both customers and the Ministry.
- 3-5 Enhance the ability to develop a financial mobilization and repayment plan for future infrastructure investments, based on the tariff levels established in 3-3.

(2) Water Sector Sustainability Improvement Project

1) Project Objective

This initiative aims to enhance the outcomes of JICA's technical cooperation with LWB while supporting the nationwide dissemination of NRW improvement knowledge, including to BWB. Additionally, it will strengthen financial management capacity across the water sector, including water tariff system reforms and loan management.

2) Cooperation scheme

Individual experts (it is assumed that experts in each field will be dispatched on a short-term basis under the work implementation contract)

3) Counterpart

Ministry of Water and Sanitation (MWS)

4) Outcomes

1: Strengthening NRW management knowledge across all Water Boards (WBs)
Facilitate knowledge-sharing on NRW management by LWB, in collaboration with the Ministry of Water and Sanitation and the Malawi Water Services Association (WASAMA) as key counterparts.

2: Support for establishing a water tariff adjustment system (Counterpart: Ministry of Water and Sanitation)
Coordinate with the BWB technical cooperation project's tariff adjustment activities (Outcome 3 of Project (1)) to support the establishment of a structured water tariff adjustment system.

3: Support for financial mobilization and management in the water sector (Counterpart: Ministry of Water and Sanitation, Ministry of Finance, and Water Boards)

Note: WBs in Malawi obtain infrastructure investment loans through the Ministry of Finance from DPs, and they are responsible for loan repayments. Therefore, this initiative will support financial mobilization and management, including loan management in the water sector.

Given that BWB incurred significant foreign exchange losses due to foreign currency-denominated loans from India's Exim Bank, it is essential to enhance financial management capacity in collaboration with the Ministry of Finance, ensuring better-informed loan management practices.

CHAPTER 5 : RECOMMENDATIONS BASED ON THE FINDINGS OF THE STUDY

5. Recommendations based on the findings of the study

5.1. Categorization of Growth Bottlenecks

5.1.1. KPI analysis results and external factors for category C utilities

The KPI analysis results of Category C utilities and the external factors that may influence the performance are summarized in the Table5-1. KPIs are evaluated on a four-level scale: Severe, Low, Moderate, and High.

Table5-1 Summary of KPI Analysis Results for Category C Utilities

Category	Sub-category	JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
Service Improvement and Investment Activities	Production capacity utilization rate (%)	97	100	77	100	62	90 (water purification plant under construction)
	Water Quality Compliance (%)	High	86	High	100	98.5	97
	Continuity of service (hours/days)	2~ 16 By Chapter	22	23	22	20	22
	Aging facilities (reference indicator)	Pipe network is over 50 years old	Pipe network is over 50 years old	About 60% are old pipes	Many dilapidated	Kampala's pipe network is over 50 years old.	World Bank renews half of its aging AC pipes
Increase customer base and satisfaction	Water supply penetration (%)	55.9	95	74	32	84	95
	Customer satisfaction (%)	44	25.2	unknown	93	86	75
Increase in fee revenue	Percentage collected (%) - Invoices collected / Total invoiced	110	99	96	80	91	95
	Non-yield water ratio (%)	55.1	55	60	32.7	34.9	40.9
	Unit cost of water supply (USD/m ³) (total cost including depreciation / volume of water sold)	0.36	1.23	3.09	0.52	1.37	0.86
	Supply price (USD/m ³) (sales revenue/sales water volume)	0.20	0.97	2.99	0.53	1.46	0.90
Management and Financial Improvements	EBITDA margin (%)	-22	-86.4	20	12	24	41
	EBITDA margin excluding deferred revenue and other income (%)	NA	-100	11	12	11	21
	O&M cost coverage ratio (%)	78	71	121	113	112	127
	O&M cost coverage excluding subsidies (%)	NA	76	111	114	131	134
	Number of staff per 1,000 connections	NA	9	12	4.2	5	5
External factors that may affect performance							
Government Policy and Influence	Availability and capacity of regulators	Yes (vulnerable)	Managed by the Ministry	Managed by the Ministry	Yes (Strong)	Managed by the Ministry	Managed by the Ministry
	Water tariff adjustment	None since 2017	Irregularly	Regular (modified to cover cost)	None since 2015	Regular (indexed)	Irregularly
	investment responsibility	Government funds	Own funds	Government funds	Own funds	Government funds + own funds	Own funds
	DP Support	Yes	Yes	Yes	Almost none	Yes	Yes

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Category	Sub-category	JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
Development potential and cost of water resources development		NA	Small, expensive	No major problem	Small, expensive	No major problem	Medium
Socioeconomic (Inflation (average of last 3 years))		7.9	19.7	3.8	5.2	4.9	19.7

Evaluation scale of KPIs:

				NA
Severe	Low	Medium	High	Unknown

The Table is compiled summarizing the key performance indicators at each stage of the growth spiral, from "Service Improvement and Investment Activities" to "Management and Financial Improvement." In This table, utilities are arranged from left to right, with those on the left having the most "severe" indicators and those on the right having the most "high" indicators. JIRAMA and BWB exhibit a higher number of "severe (or unknown)" indicators, whereas NWSC and LWB have fewer "severe" and "low" indicators.

The production capacity utilization rate indicates the current production capacity that is still not used and can be utilized to cater to water demand, which helps assess whether the utility can accommodate current water demand and future increases in water demand. In the cases of JIRAMA, BWB, and MCWD, the production capacity utilization rate is nearly 100%, leaving no room for expansion of service coverage. To improve water services, it is necessary to enhance this utilization rate. Customer satisfaction is also low for JIRAMA and BWB, whereas it is high for MCWD, NWSC, and LWB.

Within Malawi, the unit cost of water supply for LWB and BWB is approximately USD 0.9/m³, making them almost identical. However, BWB's average water tariff is about 1.5 times higher than LWB's. The high electricity costs associated with water conveyance in BWB are the primary reason for its high tariff. SIWA is a utility that can independently adjust water tariffs to match its costs, resulting in the highest water tariff among the target utilities.

The external factors affecting the utilities have also been evaluated. JIRAMA and MCWD have regulatory authorities, but their effectiveness varies: JIRAMA (Madagascar) has a weak regulatory framework, while MCWD faces strict regulations and functions fragmented among several regulators. Neither JIRAMA nor MCWD have undergone water tariff adjustments for an extended period. In the case of MCWD, the regulatory authority has not approved any tariff revisions since 2015. Although MCWD has managed to achieve a positive financial balance through internal efforts, improvements in the regulatory framework are deemed necessary.

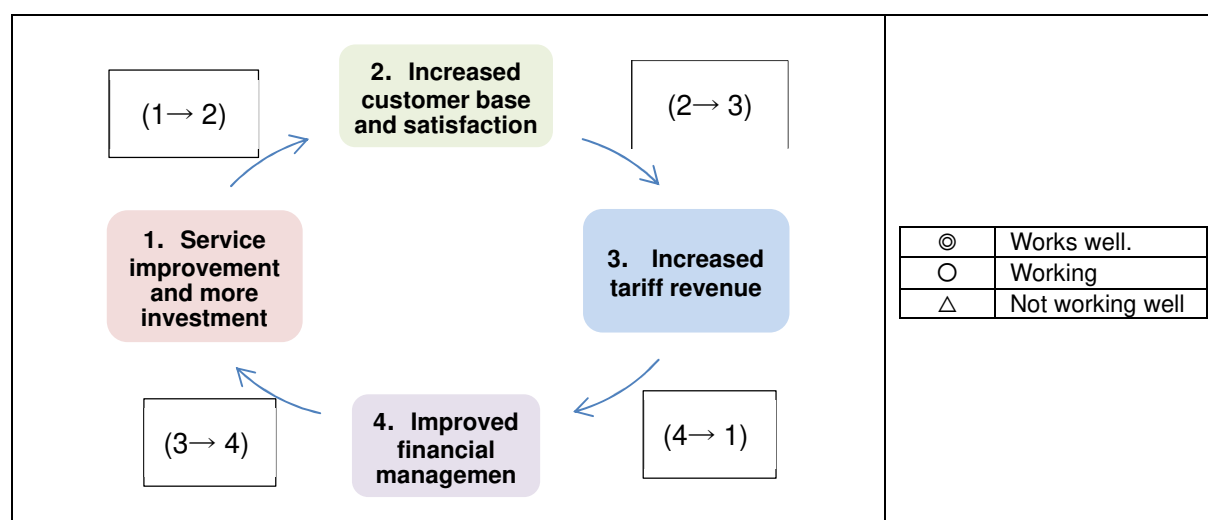
The responsibility for infrastructure investment also differs across utilities. Utilities that can invest using "government funds" or a combination of "government funds + own utility funds" are supported by the government, allowing them to undertake infrastructure development even with little or no self-financing. From the perspective of water utility growth, it is necessary to reconsider such investment responsibility policies moving forward. Additionally, Malawi has a high inflation rate, requiring a tariff adjustment mechanism to counter rising costs, but no regulatory authority exists.

5.1.2. Results of growth spiral analysis for category C utilities

The results of the growth spiral analysis for the target utilities are summarized below. JIRAMA and BWB have all spiral elements not working, indicating a failure in their growth mechanisms. Comprehensive management reforms are required. SIWA and MCWD have an element that is working towards increasing tariff revenue. However, infrastructure development and service improvements are necessary. NWSC and LWB have a working growth spiral. However, NWSC's growth is supported by infrastructure investment funds from the government and development partners (DPs). Moving forward, self-financed growth is desirable. For LWB, further stabilization of the growth spiral can be achieved by addressing high inflation and reducing NRW.

Table5-2 Results of Growth Spiral Analysis for Target Utilities

Element	JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
(1→ 2)	△	△	△	△	◎	◎
(2→ 3)	△	△	○	○	◎	◎
(3→ 4)	△	△	△	△	○	○
(4→ 1)	△	△	△	△	◎/△	○



5.1.3. Summary of bottlenecks for category C utilities

Table5-4 presents the results of a detailed analysis of the bottlenecks affecting the target water utilities, categorized into internal and external factors along with their respective areas of responsibility. Additionally, Table5-3 provides an overview of the severity of these bottlenecks, classified into three levels: ○ (low), △ (medium), and × (high).

JIRAMA and BWB have the highest number of significant bottlenecks, followed by SIWA and MCWD, while NWSC and LWB have relatively fewer major bottlenecks.

The primary differences in the areas of responsibility among water utilities are as follows. These differences influence the growth of the utilities, and it is essential to consider them when examining

potential solutions.

- Scope of operations: Nationwide (both urban and rural) or single city or region
- Investment responsibility: Government-funded or self-financed
- Independent regulatory authority: Presence and functional effectiveness

Table5-3 Summary of Responsibilities and Bottlenecks of Category C Water Utilities

Item	Sub-item		JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
Responsibility	Area of jurisdiction		Whole country	Blantyre	Whole country (Urban)	4 cities and 4 towns in Metro Cebu area	Whole country	Lilongwe.
	Business scope		Water and electricity	Drinking water only	Water and wastewater (limited proportion of sewage)	Water and wastewater (limited proportion of sewage)	Water and wastewater (limited proportion of sewage)	Water and wastewater (sewage added in 2023)
	Investment responsibility		Government funds	Utility funds	Government funds	Utility funds	Government fund for medium and large scale investment	Utility funds
	Potential for future area expansion (growth)		High	Medium	High	High to low	Highy	Low
	Regulatory maturity		Low (2 institutions)	Low (by Ministry)	Low (by Ministry)	Strong (multiple institutions)	Medium (by Ministry)	Low (by Ministry)
Internal factor	Facility improvement		x	x	o	△	o	o
	Level of service		x	x	x	o	o	o
	Management efficiency	Management efficiency (NRW)	x	x	x	△	△	△
		O&M costs	x	x	x	△	o	o
		Water tariff setting	x	x	o	x	o	△
	Financial capacity	Business and financial management (profitability, etc.)	x	x	o	o	o	o
		Self-investment ability	x	x	△	△	△	o
	Managerial improvement capability	Existence of a business improvement plan	x	△	△	o	o	o
		Leadership	o	NA	o	o	NA	o
External factor	Government	Policy	x	o	△	x	△	o
		Regulatory performance	x	△	△	x	△	△
		Investment responsibility	x	o	x	o	x	o
	Water source/Climate change		NA	x	△	x	o	o
	Inflation and currency depreciation		△	x	△	△	△	x
	DP support (investment)		o	o	o	x	o	o
The number of bottlenecks (×)			11	9	4	5	1	1
The nmbor of bottlenecks (△)			1	2	6	5	5	3

Scale of bottlenecks

x	△	o	NA
Large	Medium	Small	Unknown

Table5-4 Responsibilities and Bottlenecks of Category C Water Utilities

Item			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
Business Environment	Area of jurisdiction		Whole country	Blantyre	Whole country (Urban)	4 cities and 4 towns in Metro Cebu area	Whole country	Lilongwe.
	Business scope		Water and electricity	Drinking water only	Water and wastewater (limited proportion of sewage)	Water and wastewater (limited proportion of sewage)	Water and wastewater (limited proportion of sewage)	Water and wastewater (sewage added in 2023)
	Investment responsibility		Government funds	Utility funds	Government funds	Utility funds	Government funds for medium and large scale investment	Utility funds
	Potential for future area expansion (growth)		High	Medium	High	High to low	High	Low
	O&M cost coverage (including subsidies, not including depreciation)			76	11	114	131	134
	O&M cost recovery (excluding depreciation and subsidies)		NA	-100	111	12	11	21
	Regulatory maturity		Low (2 institutions)	Low (by Ministry)	Low (by Ministry)	Strong (multiple institutions)	Medium (by Ministry)	Low (by Ministry)
Internal factors	Facility improvement	Utilization ratio of production capacity (%)	97	Actual 100 (Calculated value is 74%, with a water purification facility with reduced functionality)	77	100	62	90 (water purification plant under construction)
		Continuity of service (Hrs/day)	2~ 16 (depending on chapter)	22	23.4	21.9	20	22
		Quality of water supplied (Compliance rate: %)	high	86.2	high	100	98.5	97
		Facility aging	Pipe network is over 50 years old	Pipe network is over 50 years old	About 60% are old pipes	Many dilapidated	Kampala's pipe network is over 50 years old.	World Bank renews half of its aging AC pipes
		Evaluation	x	x	△	△	△	△
	Level of service	Coverage ratio (%)	55.9	95	74	32	84	95
		Population size of water supply (degree of)	4,081,410	1,260,873	65,000	642,167 (2022)	19,000,000	1,120,085
			58	25.2	unknown	93	86	75

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Item			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
		customer satisfaction						
		Commercial operations (customer satisfaction, etc.)	Complaints are handled by a call center. The average response time is quite long, around 7 days. customer satisfaction in 2024 is low at 44%.	Very low. There is a backlog of 10,000 cases for every connection request.	No customer satisfaction surveys have been conducted and satisfaction is unknown. Ability and willingness to pay fees is unknown. Water rates are very high. This is thought to be one of the reasons for illegal connections. Water supply is frequently interrupted during the rainy season due to high turbidity. The current CEO intends to reform the company to make it more customer-oriented and service-oriented.	The company conducts regular customer satisfaction surveys, and satisfaction is high.	A Customer Relationship Module (CRM) is in place to receive complaints and comments from all sources. When complaints are resolved, feedback is provided to the customer. The average resolution rate over the past four years is 99%. Satisfaction is also high.	Customer satisfaction improved significantly from 2018 levels before Turnaround was implemented.
		Evaluation	x	x	x	o	o	o
	Operational Efficiency	Management efficiency (NRW)	Very high NRW ratio (45%); target of 42% NRW ratio by 2025; one-third of the losses are considered physical losses and two-thirds are commercial losses. There is a desire to install prepaid meters for improvement.	The NRW ratio is very high (55%). In addition to high power costs, this is putting further pressure on management.	Extremely high NRW ratio (60%). Leakage due to aging pipes, high water supply pressure, etc. and illegal connections, which are assumed to be caused by high water rates, have been on the rise in recent years.	The NRW rate is high (33%). However, the cause is that residents destroyed facilities in search of water when the water supply was suspended due to the occurrence of a typhoon in 2021; prior to that, there were years when the rate was around 20%.	The NRW ratio is high (35%), and Kampala, with the largest water supply population, is as high as 40%. It is assumed that leaks are mainly due to aging pipes and high water supply pressure.	Although the NRW ratio is high (41%), it has begun to decrease as WB renews old pipes, DMA and SCADA are introduced, and JICA technical professionals' technology is utilized.
		Evaluation	x	x	x	△	△	△
		O&M costs	The electric utility pays its fuel costs through subsidies and government borrowing. The water utility also does not pay for power costs. It has also not repaid its borrowings from the government. However, water supply costs are low. There is a shortage of human	The main water source river is more than 40 km away, and water is pumped by boosting pumps over a height difference of 800 m. The high cost of electricity is putting pressure on the company's operations. The high cost of electricity due to these pumps is putting pressure on	Electricity costs are very high. Being an island nation, all materials and equipment are expensive. The cost of water supply is by far the highest among the six utilities in this study.	Water sources are scarce, and water source costs are increasing due to RO and long-distance water conduits. In particular, the cost of receiving water from private suppliers who use RO to supply water accounts for 40% of the total cost.	High labor cost ratio. Is it for high-performance personnel? There is a training center and a training program.	Maintenance costs are kept low due to outsourcing, with 5 people per 1000 connections.

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Item			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
			resources, employment of temporary staff (inefficiency, high retirement rate), and no training system, which poses a major challenge to human resource development.	management. The Ministry of Water and Power has adjusted the level of electricity rates to be applied, and this has been in effect since September.				
		Evaluation	x	x	x	△	○	○
		Water tariff setting	No water rate revision since 2017 due to lack of MEAH approval. Both electricity and water tariff revenues are at a level where O&M costs cannot be covered by tariff revenues.	Water rates have not been set in line with high costs; after raising rates in 2018, increases were implemented in 2023 and 2024, and even in the most recent years, the company is still in the red. The company does not foresee regular water rate revisions in the face of high inflation.	The utility can easily revise water rates and set the rates to cover maintenance and management costs. Therefore, water rates are very high, more than 10% of revenues.	No water rate increase in 10 years; applied for another increase 2 years ago; LWUA regulates and delays approval.	Water rates are updated annually according to indexes (inflation, electricity rates, foreign exchange). ¹ (Note that the scope of investments made with the company's own funds is limited, and large investments are made with grants, which helps to keep water rates under control.)	The implementation of a 40% water rate increase in 2023 has resulted in a significant increase in operating income. However, the outlook for regular water rate changes is bleak if the company is unable to raise rates quickly in the future as inflation continues to rise.
		Evaluation	x	x	○	x	○	△
	Financial capability	Business and financial management (profitability, etc.)	Both the electric power and water services are significantly in the red, and O&M costs are not being covered. The ratio of sales is 90% for electric power and 10% for water, and fund management is the same as for the electric power business. Local branches across the country report monthly to the head office on the status of their operations, etc., based on KPIs set by the head office. However, the annual reports do not compare actual results with KPI targets, and there are concerns about the actual status of management under the	O&M costs cannot be covered. The high cost of electricity, which is the main cause of these costs, is expected to improve since the company has agreed to apply a special rate with the power company. Furthermore, long-term non-payment by the public sector is causing cash flow problems. The high inflation has resulted in double losses due to delayed payments. Foreign exchange losses on foreign currency-denominated borrowings have been incurred, but arrangements are being made with the government to prevent	O&M cost coverage is 121%. Basically, the water rates have been revised to cover O&M costs.	The O&M cost recovery (114%) has been achieved, including facility maintenance costs, and is not nearly subsidized. However, infrastructure development costs are minuscule.	O&M cost coverage is 130%, but decreases to 112% excluding subsidies. There is a long-term non-payment by the public sector, which has not been resolved despite the introduction of prepaid meters.	O&M cost coverage is 134%, or 127% excluding subsidies. Long-term non-payments by the public sector are affecting the cash flow. Non-payment is a double loss: high inflation and discounting.

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Item			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
			KPIs. Furthermore, some of the local chapters do not have a finance officer, and there are reportedly issues with financial management capacity. Frequent reorganization by top management has resulted in a lack of organizational strength.	such losses from occurring in the future.				
		Evaluation	×	×	○	○	○	○
		Management efficiency	EBITDA margin and O&M cost coverage ratio both negative	EBITDA margin and O&M cost coverage ratio both negative	EBITDA margins and O&M cost coverage are insufficient for large investments	EBITDA margins and O&M cost coverage are insufficient for large investments	EBITDA margins and O&M cost coverage are insufficient for large investments	O&M cost coverage is mostly good, EBITDA margin excluding foreign exchange earnings is not high
		Evaluation	×	×	△	△	△	○
	Improvement of management	Existence of a business improvement plan	JIRAMA's restructuring plan for 2024 lacks details for achieving medium-term cost recovery.	A three-year management improvement plan has been prepared and is being implemented, with the goal of achieving break even by 2025/2026. However, the possibility of achieving this goal is uncertain.	Created and being implemented by the current CEO.	A 10-year business plan has been prepared and submitted to the LWUA, which is required to apply for a rate increase.	Turnaround plan has been implemented in the past and continuous improvement is being implemented.	Turnaround plan has been implemented. Continued to develop strategic plan.
		Evaluation	×	△	△	○	○	○
		Leadership	The CEO and CFO are individuals with foreign experience who were appointed in 2024 after receiving nominations from the World Bank and are aware of JIRAMA's challenges and are committed to improvement. The executive level is also well aware of the situation and has a high awareness for improvement.	The CEO could not be interviewed due to his absence during the two site visits. However, senior management is well aware of the situation. The World Bank commented that it does not yet appear to have the capacity to prioritize and strategically implement reforms.	Yes. Hired an Australian with extensive experience in water utility management about a year ago. Business improvement is underway with a customer-centric focus.	Experienced in the finance department at MCWD, rehired and hired by GM. Well-organized and well-coordinated as an organization.	No interviews. Executives are excellent.	CEO leadership is high. Commitment to the business is strong.
		Evaluation	○	△	○	○	△	○

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Item		JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
External factors	Water source/Climate change	Jurisdictional coverage varies from place to place due to the national scope of the country. It is particularly vulnerable to natural disasters (cyclones) and is in the top 5 countries most affected by climate change. It is a national organization and water resource conditions vary from region to region.	The water source is mainly river water. Due to logging in the river basin, silty and highly turbid raw water is withdrawn during the rainy season. Frequent pump breakage and reduced efficiency due to high silt water. Dam capacity and water intake decreased due to sedimentation in the dam.	Insufficient river water due to island countries. Groundwater and spring water are used, but intake of spring water is suspended due to high turbidity during the rainy season. The cause of high turbidity is logging in the watersheds of water sources. Suspension of water supply is lowering the level of satisfaction.	Water resources are scarce due to island countries. Groundwater is depleted and saline due to over-pumping and unmanaged private wells, increasing dependence on RO. Water-rich rivers are located beyond 60~100 km, making development politically and economically difficult.	Lake Victoria, groundwater available. No problems with water source; DP-supported water purification plant improvements have allowed for ample water production.	River water: Water discharged from dams located beyond 28 km from the city is naturally discharged to the intake point in the city and taken. The cost of water conveyance is small. Highly turbid water is taken in by logging in the watershed of the branch line that flows downstream from the dam. Inflow of ultra-polluted water due to silt during the rainy season. (There is a plan to send water through a pipeline from the dam, but this will increase water intake costs.)
	Evaluation	unknown	×	△	×	○	○
	Government policy	No strategy in interviews; expect JICA survey. Concession contract (mainly maintenance). No own funds (deficit). Investment can be carried out by national government or utility. In effect, implemented by the Ministry.	100% penetration by 2030; NRW target 25%. There is a commitment to improve management with support from the World Bank, including government coordination of reductions in electricity tariff levels. No regulatory agency.	Excluded from state-owned enterprises since August. The Board of Directors will be comprised primarily of ministry personnel from the business community. Ministry is the supervisory body. There is no regulatory body. Currently, there is no impact from the exclusion of state-owned enterprises.	No regulatory agency for water supply. There are many regulatory agencies. The government is prepared to establish a supervisory authority for the water sector.	To increase national penetration, investments are made by the government and facilities are transferred. Therefore, water rates are set relatively low without the need to cover the investment. Regulation is carried out by the Ministry.	100% penetration by 2030; NRW target 25%. No regulatory agency.
	Evaluation	×	○	△	×	○	○
	DP support (investment)	The World Bank is preparing a master plan for the Antananarivo Metropolitan Area. New water supply facilities are planned to be developed based on the results of the plan. The EIB is also conducting a study on the	World Bank support is underway to improve the facility; DP support is available, but the amount is less than half of LWB's. Repayment is required, but the government takes the foreign exchange risk of repayment. Plans to	DP support available (DFAT, ADB, JICA)	Almost no DP support; JICA supported water supply in the past and now supports sewage.	DP support available (mainly AFD to address Kampala NRW, etc.). Investments are made by the government through borrowing. Self-financed investment is small scale only. Without government investment, the growth	DP support available (World Bank), to be completed in June 2025. NRW-TC is supported by JICA.

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Item		JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
		accounting separation of electricity and water utilities, and plans to develop water supply facilities in Toamasina, among others.	seek support from other DPs, but not for the construction of a solar power generation facility, which was planned with the support of Exim bank in India.			cycle would not turn.	
	Evaluation	○	○	○	×	○	○
	Inflation and currency depreciation	9.9% (2023)	Currency depreciation is significant, leading to high inflation rate: 28.8%, currency depreciation rate 50% (2023)	5.9% (2.23)	6.0% (2023)	5.4% (2023)	Currency depreciation is significant, leading to high inflation rate: 28.8%, currency depreciation rate 50% (2023)
	Evaluation	△	×	△	△	△	×
The number of large bottlenecks (×)		8	8	3	3	0	1
The number of medium bottlenecks (△)		1	2	5	6	4	2

Scale of bottlenecks

×	△	○	NA
Large	Medium	Small	Unknown

5.1.4. Categorization of bottlenecks

This study is based on the assumption that the growth of urban water utilities is driven by the virtuous cycle of four growth elements, enabling them to progress from Development Stage 2 to Stage 3. Based on the survey results of the target utilities, the factors hindering the circulation of these elements are categorized and organized as follows.

As the first step, it is necessary to improve services through investment in infrastructure development. The potential reasons why investment in infrastructure development do not materialize are as follows.

Table5-5 Bottleneck regarding Insufficient Investment in Infrastructure Development (4→1)

1. Causes of insufficient investment in infrastructure development (4→1)	
1.1	Insufficient investment funds for water utilities (External factor) - The investment needs of water utilities cannot be fully met by the government, development partners (DPs), or the private sector. - Key investment areas include water source development, rehabilitation and expansion of water treatment plants, replacement and rehabilitation of aging pipelines, reconstruction and expansion of transmission and distribution networks, and the establishment of water quality laboratories, all of which require significant financial resources.
1.2	Insufficient government subsidies (External factor) In developing countries, securing adequate budget allocations for the water sector is typically challenging. As a result, the sector relies heavily on funding from development partners (DPs).
1.3	Insufficient Development Partner (DP) funding (grants and loans) (External factor) Due to the limited availability of government funds, investment from development partners is essential to bridge the financing gap.
1.4	Lack of private sector investment and funding (Internal & external factors) - The lack of financial and operational capacity of utilities makes the sector unattractive to private investors. - The low return on investment in the water sector discourages private sector involvement, making it difficult to attract private sector capital.
1.5	Weak financial capacity and limited self-financing capability of utilities - This issue stems from inadequate business and financial management capacity within utilities. - Traditionally, large-scale investments are considered the responsibility of the government, reducing the need for utilities to strengthen their financial capacity and secure self-financing for investments.

The assumption is that if the demand for funds for water services can be met, facilities will be upgraded and water supply service will improve. Improved water supply service increases customer confidence and satisfaction, which in turn increases the number of customers and improves the penetration rate. Possible factors hindering the second step in the cycle include the following.

Table5-6 Bottlenecks regarding Limited Customer Growth and Stagnant Coverage Ratio (1→2)

2. Causes of limited customer growth and stagnant coverage ratio despite service improvements through infrastructure development (1→2)	
2.1	Lack of Customer Satisfaction (Customer-Centric Management Not Implemented) - Customer satisfaction is not properly assessed (no customer surveys conducted). - Customers' willingness and ability to pay are not reflected in the water tariff structure. - Customer service and responsiveness are insufficient.
2.2	Inadequate operation and maintenance (O&M)

2.3 Aging infrastructure and declining operational efficiency

The assumption is that an increase in customers and their satisfaction will increase water sales. Possible causes of the impediment to the third step of the cycle include the following.

Table5-7 Bottlenecks regarding Water Tariff Revenue Not Increasing Proportionally with Customer Base Growth (2→3)

3. Causes of water revenue not increasing in proportion to customer base growth (2→ 3)
3.1 Low revenue collection rate • Customers fail to pay their bills, leading to unpaid and overdue accounts. • Increased non-payment and delayed payments by public institutions. • Inaccuracies in water meter readings, leading to billing issues.
3.2 High NRW • High Physical Losses - Aging pipelines are not being replaced. - Leakage control measures are insufficient. • High Commercial Losses - Deficiencies in water meter management (faulty or tampered meters). - Illegal connections due to low willingness or inability to pay.

The assumption is that an increase in water rate revenues will improve financial and investment capacity. We consider the following causes to be inhibiting the improvement of financial and investment capacity.

Table5-8 Bottlenecks regarding Financial Capacity Not Improving Despite Increased Water Tariff Revenue (3→4)

4. Causes of increased water revenue without improvement in financial capacity (3→ 4)
4.1 High operation and maintenance (O&M) costs • Rising costs of materials, labor, and other expenses due to high inflation. • High energy costs, increasing the financial burden on utilities.
4.2 High NRW • High cost per unit of billed water due to excessive water losses.
4.3 Water tariffs do not cover costs, and regular adjustments are not implemented • Tariffs are not set at a level sufficient to cover operational costs. • Regular tariff adjustments are not conducted. • Regulatory oversight on tariff adjustments is insufficient. (Refer to the external factor " Impacts of political, legal, and regulatory factors" for details.)

The following are possible impediments to the organization and governance to turn the entire growth spiral around.

Table5-9 Bottlenecks regarding Organizational and Governance Issues

5. Weak organizational structure and governance (Overall)
5.1 Human resource shortages and delayed capacity development
5.2 Lack of business planning and strategic direction
5.3 Organizational inefficiencies (unclear roles and responsibilities)
5.4 Weak governance (Lack of transparency and accountability)

External factors preventing the growth spiral of water utilities from functioning may include the following.

Table5-10 External Bottlenecks hindering Growth Spiral

6. Impacts of political, legal, and regulatory factors
6.1 Investments (especially large-scale) are considered government's responsibility, making full cost recovery unnecessary
6.2 Lack of or inadequate regulations for tariff adjustments
6.3 Excessive regulation of water utilities (difficulty in adjusting water tariffs)
6.4 Political interference (political influence on tariff setting)
6.5 Administrative procedures for business licensing at the local government level are not smooth
7. Impacts of socioeconomic conditions
7.1 Low payment ability and awareness among users
7.2 Deteriorating financial viability in poor or mixed-income areas
7.3 Rapid population growth and urbanization outpacing water infrastructure development
8. impacts of human activities
8.1 Increased groundwater extraction from private wells affecting utility groundwater sources
8.2 Anthropogenic groundwater pollution (salinization, nitrate contamination)
8.3 Deforestation and vegetation changes in water source areas lead to raw water quality deterioration through increased turbidity and siltation causing higher treatment costs, pump maintenance issues, and intake shutdowns.
9. impacts of natural conditions, natural disasters, and climate change
9.1 Existing water sources have high-cost conditions (remote locations, large elevation differences)
9.2 Additional water resources require high-cost development (remote areas, elevation challenges, introduction of desalination (ro) plants)
9.3 Cyclone damage leading to destruction of water supply infrastructure and financial losses
9.4 Changes in water source conditions due to climate change

Based on the above categorization, the impact of bottlenecks in target utilities was evaluated using a four-level scale: high, medium, low, and none (see the Table below). In the Table, the numbering of the categorized bottlenecks has been revised. Specifically, the above factor "1. Insufficient investment in infrastructure development" has been divided into internal and external factors, as shown in the Table below.

Table5-11 Degree of Impact of Each Bottleneck in Target Utilities

	No.	Item	Degree of influence on growth spiral					
			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
Internal factor	1	Organization & Governance (Table 5-9)						
	1.1	Organizational inefficiencies (unclear roles and responsibilities)	2	2	1	0	0	1
	1.2	Lack of human resources and delays in capacity building	3	2	1	1	1	1
	1.3	Lack of a business plan or strategy	3	3	2	0	0	1
	1.4	Weak governance (lack of transparency and accountability)	3	NA	0	0	0	0
	2	Improvements in service due to facility upgrades improve the number of customers or penetration rate (Table 5-6)						
	2.1	Customer satisfaction has not improved (customer-focused management is not in place)	3	3	3	1	1	1
	2.2	Lack of maintenance capacity	3	3	3	1	1	1
	2.3	Aging facilities and equipment and deteriorating efficiency	3	3	2	2	2	1
	2.4	Inadequate maintenance costs	3	3	2	2	0	0
	3	Water rate revenues do not increase in proportion to customer growth (Table 5-7)						
	3.1	Low fee collection rate	1	1	1	2	1	1

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	No.	Item	Degree of influence on growth spiral					
			JIRAMA	BWB	SIWA	MCWD	NWSC	LWB
	3.2	Inefficient maintenance (high NRW ratio), High NRW ratio and high cost per unit of water received	3	3	3	2	2	2
	4	Increased water rate revenues but improvement in financial capacity (Table 5-8)						
	4.1	High maintenance costs	0	3	3	0	2	1
	4.2	High non-yielding water (3.2)	3	3	3	2	2	2
	4.3	Water rate adjustments not implemented, inadequate conciliation (6.1)	3	2	0	3	0	1
	5	Insufficient funds for own investment in facility development (Table 5-5 (1.5))						
	5.1	Insufficient financial capacity of the utility and ability to invest with own funds	3	3	3	1	1	1
External factor	6	External funding (Table 5.5 (1.1-1.4))						
	6.1	Large funding needs in the water utility cannot be met by the government, DP, or private sector.	3	3	3	3	3	3
	6.2	No or little government assistance and DP funding (grant and paid)	1	1	1	3	1	1
	7	Insufficient or inadequate laws, regulations, and institutions (sector governance (Table 5-10 (6)))						
	7.1	Investments (especially large scale) are the responsibility of the government and do not require full cost recovery	3	0	3	0	3	0
	7.2	No or inadequate rules for water rate revisions	3	2	0	3	0	1
	7.3	Water services are too highly regulated (including by the Ministry)	0	0	0	3	0	0
	7.4	Politics intervenes (political influence on rate setting)	3	2	0	2	0	2
	7.5	Licensing of business in the local government is not smooth	NA	NA	NA	3	NA	NA
	8	Influence of social environment (Table 5-10 (7))						
	8.1	Low ability and awareness of users to pay fees	NA	1	3	1	2	1
	8.2	Deterioration of profitability in poor areas or areas that include poor areas	NA		2	NA	2	
	8.3	Population growth and urbanization have not kept pace with water supply development.	1	1	1	2	2	1
	9	Impact of anthropogenic activities (Table 5-10 (8))						
	9.1	Increased groundwater pumping by private wells affects the utility's groundwater sources	NA	2	1	3	0	0
	9.2	Anthropogenic groundwater contamination (salinization, nitrate ions)	NA	NA	NA	3	NA	NA
	9.3	Deforestation and changes in vegetation in watersheds have resulted in a decrease in water sources and deterioration of raw water quality.	NA	2	3	0	0	2
	10	Natural conditions, impacts of natural disasters and climate change (Table 5-10 (9))						
	10.1	Existing water sources have high-cost conditions (remote location, elevation difference)	NA	3	1	1	0	1
	10.2	High-cost conditions for additional water resources (remote locations, elevation differences, desalination facility (RO) installation)	NA	2	1	3	0	2
	10.3	Damage to water supply facilities due to cyclones and other natural disasters, financial	2	2	0	3	0	1

Scale of impact on growth spiral

3	2	1	0
High	Medium	Low	None

NA: Unknown

5.2. Proposal for Approaches to Transition to Development Stage 3

5.2.1. Concept of the approach

Based on the findings of the analysis, this study explores effective approaches to facilitate the growth of water utilities in Development Stage 2 and supports their transition to Development Stage 3.

When considering approaches for utilities in Development Stage 2, it is crucial to take a broad perspective rather than focusing excessively on details, as doing so may obscure the overall picture. Since water utilities face a diverse range of bottlenecks, attempting to standardize a comprehensive and exhaustive approach could result in an overwhelming number of strategies, making it difficult to select the most effective ones. Therefore, rather than standardizing approaches, it is essential to accurately assess the bottlenecks specific to each water utility and develop tailored, customized approaches to address their individual challenges. In this study, the following key aspects are considered when formulating a broad framework for the approach:

- Segmentation of Development Stage 2: There are significant variations in the level of progress among utilities within Development Stage 2. To account for these differences, this study classifies them into three sub-categories and proposes broad approaches tailored to each.
- Procedure for developing improvement approaches: A systematic approach is established for creating strategies to address the specific bottlenecks identified for each utility.
- Differentiation between national and city/regional-level utilities: Since national utilities and city/regional-level water utilities have different characteristics, distinct approaches are developed for each.

5.2.2. Positioning of utilities within development stage 2

5.2.2.1. Scale of outcomes required for establishing growth spiral through resolution of bottlenecks

The results of the analysis regarding the necessary outcomes for the target water utilities are summarized in the Table below. The identified bottlenecks are categorized into internal and external activities to better structure the approach. The required level of outcomes is assessed using a four-level scale (high, medium, low, and none). The levels for each factor are summed, and based on their total scores, the utilities are categorized into three groups:

- Group A (JIRAMA, BWB): Total score around 30
- Group B (SIWA, MCWD): Total score around 20
- Group C (NWSC, LWB): Total score around 10

The higher the total score, the greater the impact of bottlenecks, which in turn means that broader and more extensive improvement approaches are required, and the expected outcomes are more significant. For internal activities, the approach must focus on the water utilities themselves, whereas for external activities: factors 9 and 10 require government intervention; factor 11 necessitates joint efforts from both the government and the water utilities.

There is a proportional relationship between utility performance and the degree of necessary improvements. Higher-performing utilities tend to have fewer bottlenecks and require fewer interventions to achieve their expected outcomes.

Key bottlenecks include:

- Internal factors: Major challenges include operational efficiency (NRW) and water tariff adjustments.
- External factors: A primary obstacle is the lack of effective regulatory frameworks, including issues related to water tariff adjustments.

Table5-12 Scale of Outcomes Required to enable the Growth Spiral by Resolving Bottlenecks

No.	Required outcome	Development stage 2							Development stage 2		
		A		B		C		Total	A	B	C
		JIRAMA	BWB	SIWA	MCWD	NWSC	LWB				
Internal activity											
1	Management reform strategy	3	3	1	0	0	0	7	6	1	0
2	Water resources development	2	3	1	3	0	1	10	5	4	1
3	Improved water service	3	3	2	1	1	1	11	6	3	2
4	Customer-oriented services	3	3	2	1	0	0	9	6	3	0
5	Human resource development	3	2	2	1	1	1	10	5	3	2
6	Operational efficiency (O&M)	3	3	1	1	0	0	8	6	2	0
7	Operational efficiency (NRW)	3	3	3	2	2	2	15	6	5	4
8	Adjustment of water tariff	3	3	2	3	1	2	14	6	5	3
External activity											
9	Government policy (Investment conditions)	3	0	3	0	3	0	9	3	3	3
10	Effective regulations	3	2	1	3	1	2	12	5	4	3
11	Solutions to water resources and climate change impacts	2	1	2	3	1	1	10	3	5	2
	Total	31	26	20	18	10	10	115	57	38	20

Evaluation scale:

3	2	1	0
Large	Medium	Small	None

5.2.2.2. Subclassification of development stage 2

As noted above, even among water utilities in Development Stage 2, there are significant variations in performance levels based on performance indicators and the scale of required improvement through the removal of bottlenecks. These differences indicate that a uniform approach cannot be applied across all utilities. Therefore, based on the scale of required improvement, which is also linked to the performance level of the water utilities, Development Stage 2 could be classified into the following three phases. The scale of required improvement through the removal of bottlenecks could also be referred to as the maturity level of the internal and external business environments of a utility.

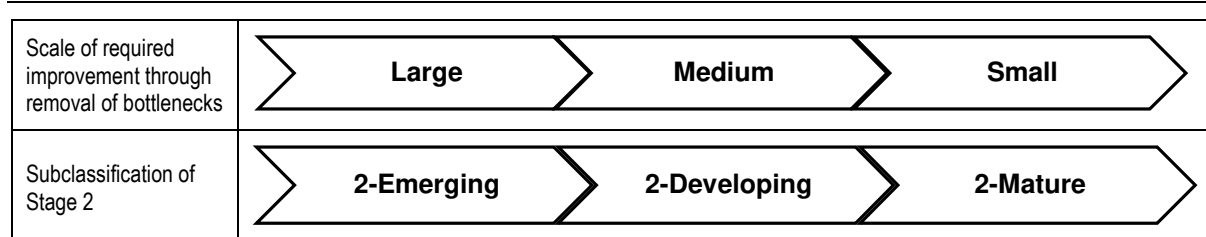


Figure -51 Subdivision of Development Stage 2 (3 Phases)

The target utilities could be categorized as follows:

- 2-Emerging (JIRAMA, BWB)
- 2-Developing (SIWA, MCWD)
- 3-Mature (NWSC, LWB)

5.2.2.3. Representation of development levels using a two-axis framework

By expressing the development levels of utilities using a two-axis framework, we can categorize their development stages and use this classification as a reference for developing tailored approaches. Two examples of such representations are provided below:

- Development levels based on internal and external bottlenecks (maturity of the business environment)
- Development levels based on sector governance (external) and utility governance (internal)

(1) Development levels based on internal and external bottlenecks

In Section 5.2.2.2, water utilities in Development Stage 2 were categorized considering the scale of required improvement of bottlenecks as a whole. On the other hand, the utility's position is presented in the following Figure, in which the scale of internal bottlenecks that the utility itself can improve and the scale of external bottlenecks that is influenced by factors outside the utility are expressed on the vertical and horizontal axes, respectively. The upper direction of the vertical axis represents the position of a utility with few internal bottlenecks (i.e., high performance), and the left direction of the horizontal axis represents the position of a utility with large external bottlenecks surrounding the utility. The following types of development levels are possible.

No.	Classification	Utility
1	Both external and internal bottlenecks are significant	JIRAMA, BWB
2	Relatively high internal bottlenecks	SIWA
3	Relatively large external bottlenecks	NWSC, MCWD
4	Both external and internal bottlenecks are not so significant	LWB

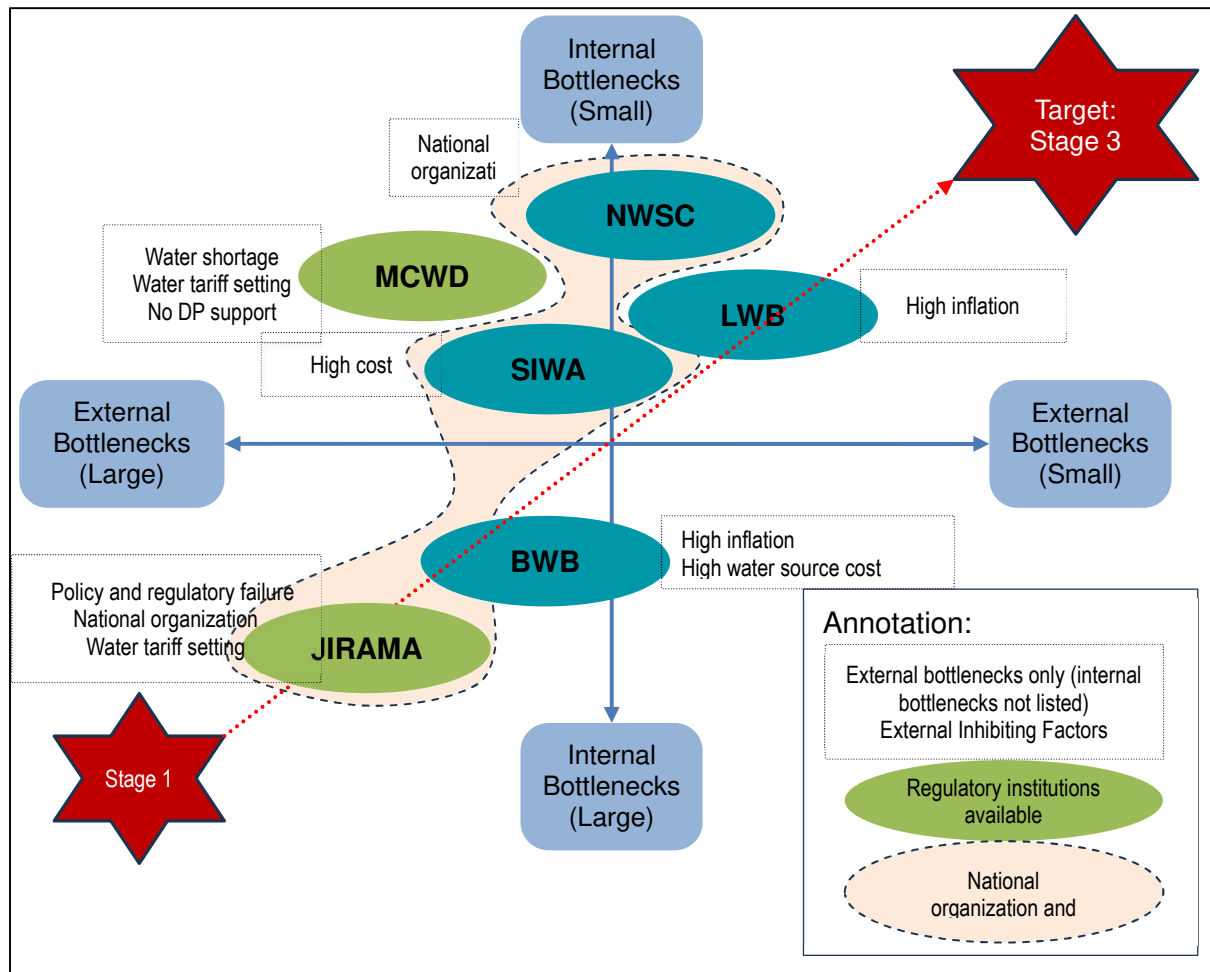


Figure 5-1 Representation of Development Levels based on the Scale of Internal and External Bottlenecks

(2) Level of development according to sector governance (external) and utility governance (internal)

The previous figure, which illustrated development levels based on internal and external bottlenecks, has been adapted to reflect sector governance (external) and utility governance (internal), both of which are essential driving forces for the development of water utilities. The next figure presents this new framework.

No.	Classification	Utility
1	Low level of sector governance (external) and utility governance (internal) functionality	JIRAMA
2	Low level of sector governance (external) functionality	SIWA, MCWD, LWB, BWB
3	Only utility governance (internal) has low functionality	
4	High level of functionality of both governances	NWSC

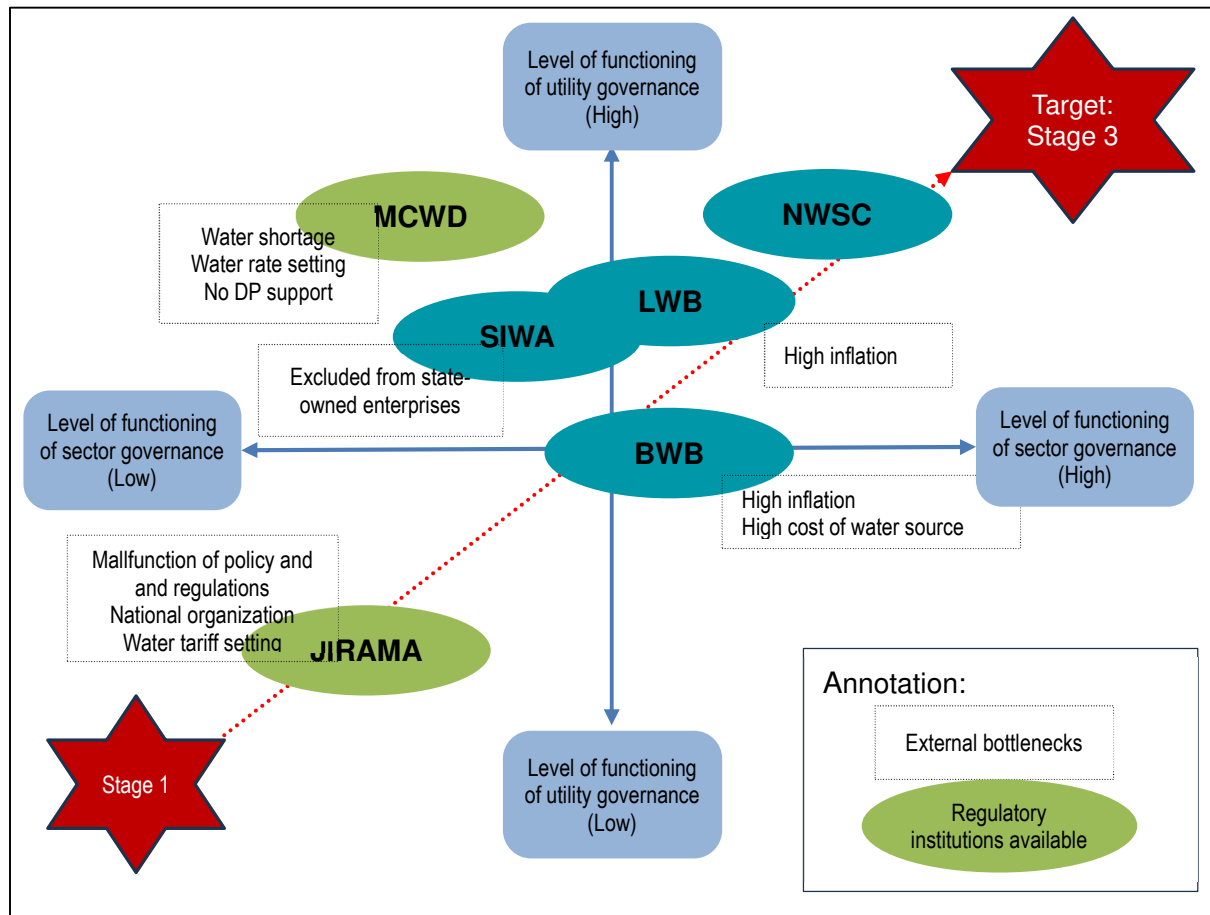


Figure 5-2 Representation of Development Levels Based on Sector Governance and Utility Governance

5.2.3. Proposed Approaches

(1) Approach for eliminating bottlenecks in utilities

This approach aims to facilitate the transition to Development Stage 3 by systematically eliminating inhibiting factors within each utility. Throughout this process, relevant KPIs will be monitored to track progress and ensure continuous improvement. This method involves addressing utility-specific bottlenecks on an individual utility basis, tailoring interventions to the specific challenges faced by each water utility. It is particularly effective for utilities with fewer inhibiting factors, as targeted interventions can lead to substantial improvements. An example case study of LWB is provided in the following Box.

BOX: Approaches to eliminating bottlenecks for utilities (Example of LWB)

Bottleneck item	Internal or external	Scale of bottleneck	Countermeasures
Management Efficiency (NRW)	Internal	△(M)	Continue to reduce the NRW ratio based on the NRW capacity improved by the JICA technical cooperation
Water tariff setting	Internal and External	△(M)	As noted in external factors, inflation rates are high. The Ministry or an established regulatory agency formulates a periodic tariff adjustment system.
Regulatory performance	External	△(M)	Currently the Ministry is the regulator, but an independent regulator is needed to regulate Water Boards including tariff adjustment. The World Bank is providing support.
Inflation and currency depreciation	External	× (Large)	Periodic tariff adjustment provisions mitigate the impact.

• **Conclusion:**

While other challenges exist, such as increased water turbidity due to deforestation in water source areas, the key measures for transitioning to Development Stage 3 are reducing the NRW rate and establishing and implementing a tariff adjustment mechanism.

• **Bottleneck Analysis and Countermeasures**

Summary of Bottleneck Analysis			
Items		Result	Countermeasures
Responsibility	Area of jurisdiction	Lilongwe	
	Business scope	Water (Sewerage started in 2023)	
	Investment responsibility	Self financing	
	Potential for future area expansion (growth)	Low	
	Regulatory maturity	Low	
External factors	Policy	○	
	Government	Regulatory performance △	Currently, the Ministry functions as the regulatory agency; however, an independent regulatory agency is necessary for tariff adjustments. The World Bank is currently providing support for this initiative.
		Investment responsibility ○	
	Water source/Climate change	○	
	Inflation and currency depreciation	×	Mitigating the impact through a regular tariff adjustment regulation.
Internal factors	DP support (investment)	○	
	Facility improvement	△	
	Level of service	○	
	Management efficiency (NRW)	△	Continuous reduction of non-revenue water (NRW) based on the improved NRW management capacity developed through the JICA Technical Cooperation Project
	O&M costs	○	
	Water tariff setting	△	As indicated in the external factors, the inflation rate is high. The ministry or a regulatory agency should be established to implement a regular tariff adjustment system.
	Business and financial management (profitability, etc.)	○	
	Self-investment ability	○	
	Existence of a business improvement plan	○	
	Leadership	○	
The number of bottlenecks (×)		1	
The number of bottlenecks (△)		3	
Phase in development stage 2		2-Mature	

• **Monitoring KPIs**

Category	Sub-category	LWB
Service Improvement and Investment Activities	Utilization ratio of production capacity (%)	90 (WTP under construction)
	Water quality compliance	22
	Continuity of Service (Hrs/day)	97
	Aged facilities	Half of the aged AC pipes replaced by the WB.
Increased customer base and satisfaction	Service coverage / Water coverage (%)	95
	Customer satisfaction (%)	75
Increased tariff revenue	Collection ratio (%) - bills collected /total billed	95
	Non-revenue water ratio(%)	40.9
	Unit cost of water supply (USD/m ³) (Overall cost including depreciation/Water sold)	0.86
	Supply price (USD/m ³) (Turnover from sales/ Water sold)	0.90
Management and Financial Improvement	EBITDA margin (%)	41
	EBITDA margin excluding deferred income and other income (%)	21
	O&M cost coverage ratio (%)	127
	O&M cost coverage ratio excluding subsidies (%)	134
	Number of staff per 1,000 connections	5
External factor	Government policy and influence	Regulator performance Managed by the Ministry
		Tariff adjustment Irregular
		Investment responsibility Self financing
		DP support WB
	Water resources development potential	Intermediate
	Socioeconomic(Inflation (past 3year average)	19.7

(2) Approach based on development levels of sector governance (external) and utility governance (internal)

The following Figure presents the approach corresponding to the development levels of sector governance (external) and utility governance (internal)—both of which are essential driving forces for the development of water utilities.

- Sector governance must be established from the early phase of Development Stage 2, as its absence would hinder the healthy growth of utilities. By the late phase of Stage 2, it is desirable to gradually shift investment responsibility from the government to utilities to facilitate a sustainable growth spiral.
- Utility governance requires a phased approach:
 - In the early phase of Stage 2, fundamental management reforms should be implemented.
 - By the mid-phase, utilities should develop strategic plans to stabilize their operations.
 - In the late phase, they should formulate an investment strategy to ensure sustainable growth.

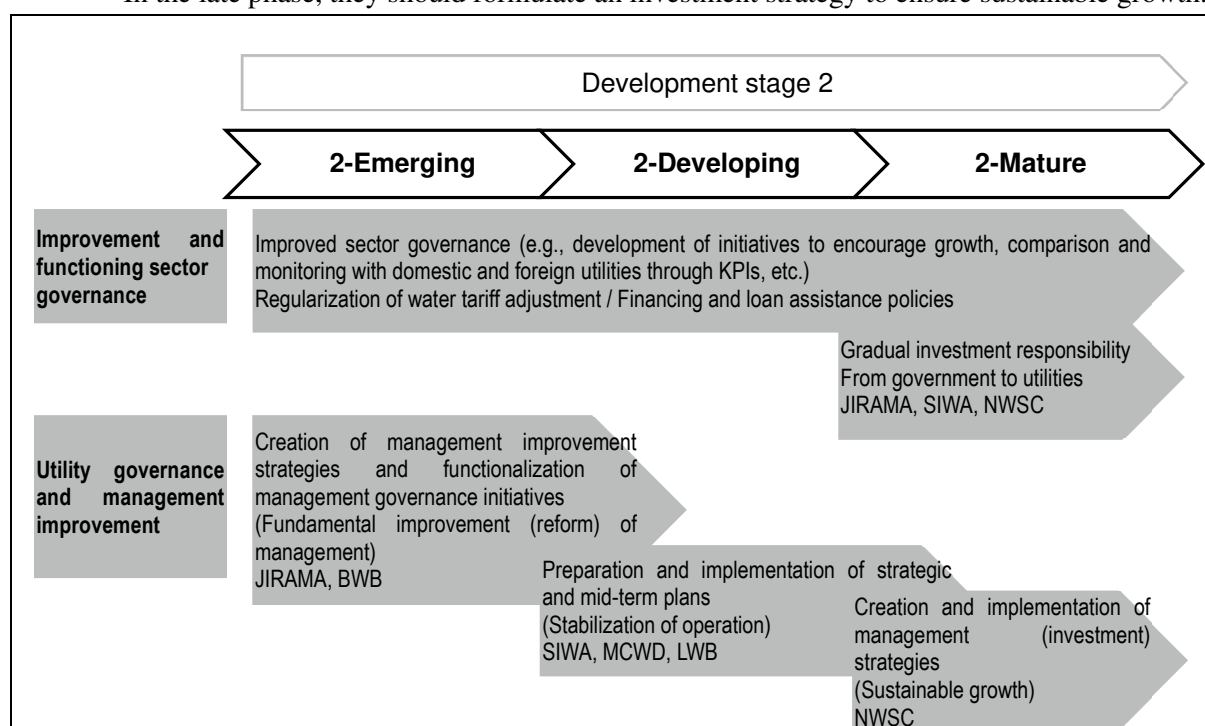


Figure 5-3 Governance and Management Improvement Approach

(3) Governance and management improvement approach for national utilities

This approach is specifically designed for enhancing governance in national utilities. The sector governance aspect follows the same principles outlined previously.

For utility governance, the approach integrates the management improvement of a core city as a model city within the broader national-level reforms. Initially, the governance and management of the model city are improved, and the lessons learned from this process are documented as best practices. The utility

headquarters then disseminates these best practices to other cities, facilitating a systematic and scalable improvement strategy. The headquarters, in collaboration with the relevant ministries or regulatory agencies, is responsible for developing the institutional environment of the model city in accordance with its stage of development. This approach is applicable to JIRAMA and NWSC, where:

- JIRAMA is expected to use the Toamasina branch as its model city.
- NWSC is expected to use Kampala Water Company as its model city.

By implementing this approach, the national utility can gradually strengthen governance and operational efficiency across multiple cities, ensuring sustainable sector-wide development.

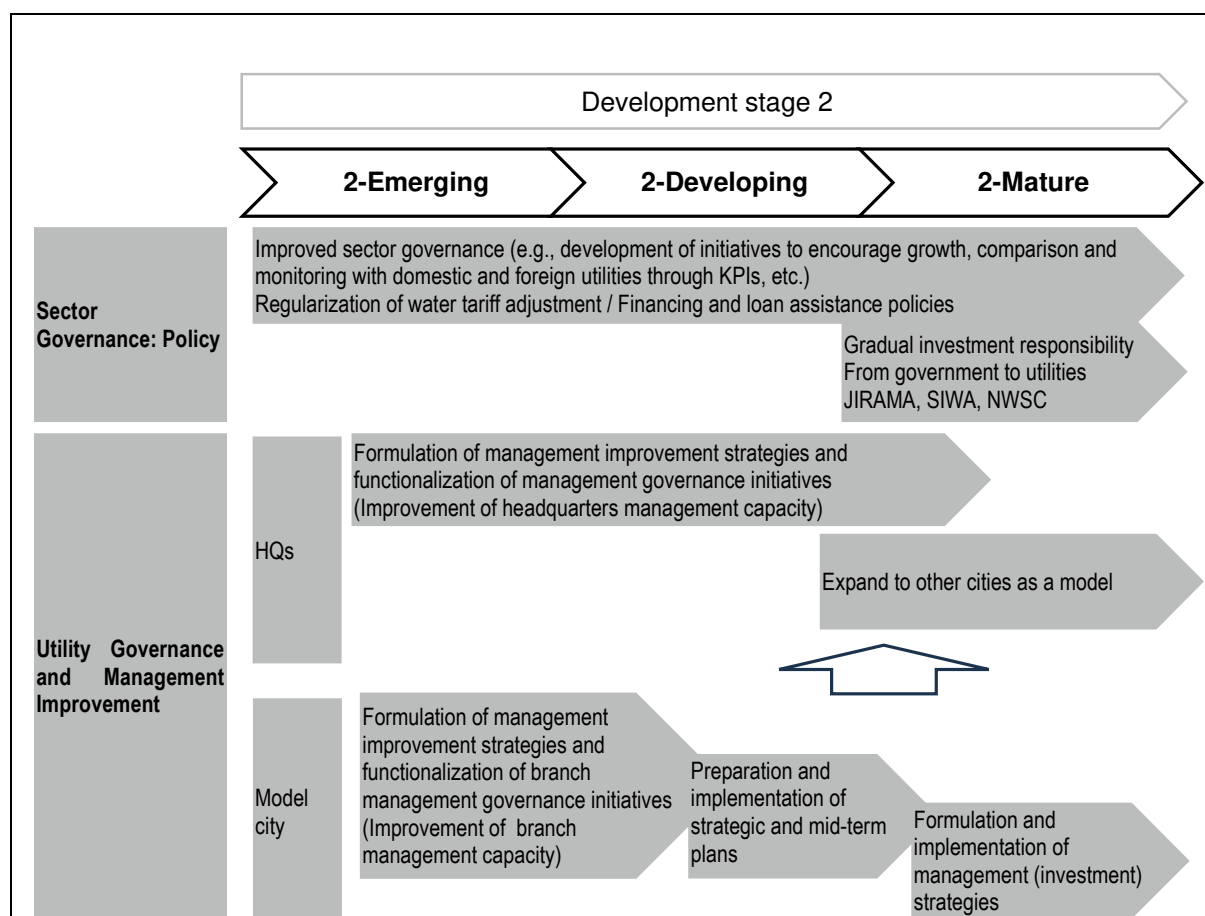


Figure 5-4 Governance Improvement Approach for National Utilities

(4) Investment funds and cost recovery strategy approach

This section proposes an investment financing and cost recovery strategy approach, using the O&M cost coverage ratio as an example indicator. The calculation formula for the O&M cost coverage ratio is based on the methodologies adopted by the World Bank and Kenya's regulatory agency, WASREB (see BOX for details).

BOX: Formula for calculating O&M cost coverage ratio:

(1) Standard O&M Cost Coverage Ratio

Operating Revenue (Water revenue + Sewerage revenue + Subsidies) / O&M Expenses (excluding depreciation and interest payments)

This formula assesses the ability of a utility to cover its operation and maintenance (O&M) costs, considering both internally generated revenue and external subsidies.

(2) O&M Cost Coverage Ratio excluding subsidies

Operating Revenue (Water revenue + Sewerage revenue) / O&M Expenses (excluding depreciation and interest payments)

Since some utilities receive significant subsidies, this adjusted ratio provides a clearer measure of their financial self-sufficiency by excluding subsidies from revenue calculations.

(Ref. 1)

Operating Cost Coverage Ratio (OCCR). The OCCR measures operational efficiency of a water utility and is calculated by operating costs divided by operating revenues. Generally, an OCCR of 1.5 has been regarded as adequate for developing countries. However, this value should always be reviewed against the need for additional financing and particularly, the current size of the fixed asset based in relation to its new investment requirements. (Crowding-In Commercial Finance in World Bank Water and Sanitation Operations - A How- To Guide for World Bank Task Teams, September 2017)

(Ref. 2)

Recovery of O+M Costs

The recovery of O+M costs by utilities is key for the sustainability of service provision. This indicator is a measure of a utility's ability to recover costs with the minimum threshold being at least 100%. For a utility to guarantee the same level of service, an O+M cost coverage of 130% is desirable. Twelve counties recorded cost coverage above 100%, with Garissa recording an impressive cost coverage of 149 %. (Impact issue No 16-2024, A Performance Report of Kenya's Water Services Sector - 2022/23, WASREB)

1) Investment funds and cost recovery strategy approach

The following Figure illustrates the target O&M cost coverage ratio and corresponding cost recovery levels through tariff revenue at each phase of development.

2.1 (Emerging phase): Achieve an O&M cost coverage ratio of 100%, ensuring full coverage of O&M costs.

2.2 (Developing phase): Achieve an O&M cost coverage ratio of 100–130%, covering O&M costs as well as small-scale rehabilitation and expansion expenses.

2.3 (Mature phase): Achieve an O&M cost coverage ratio of 130% or higher, ensuring the coverage of O&M costs and principal repayments and interest payments for concessional loans used for medium-scale infrastructure investments.

Note: The annual "depreciation + operating profit" can be utilized for repaying principal and interest on borrowings.

For the phase 2.2, O&M cost coverage ratio, a 130% target has been set, referencing the methodology outlined in the Kenya case study (Box above) while assuming infrastructure rehabilitation necessary to maintain the current level of service. For the phase 2.3, the target is 130% or higher. This O&M cost coverage ratio serves as a guideline, and it is important to note that the required O&M cost coverage ratio may vary depending on factors such as the business costs of new infrastructure investments and the scale of new investments relative to current operating revenue.

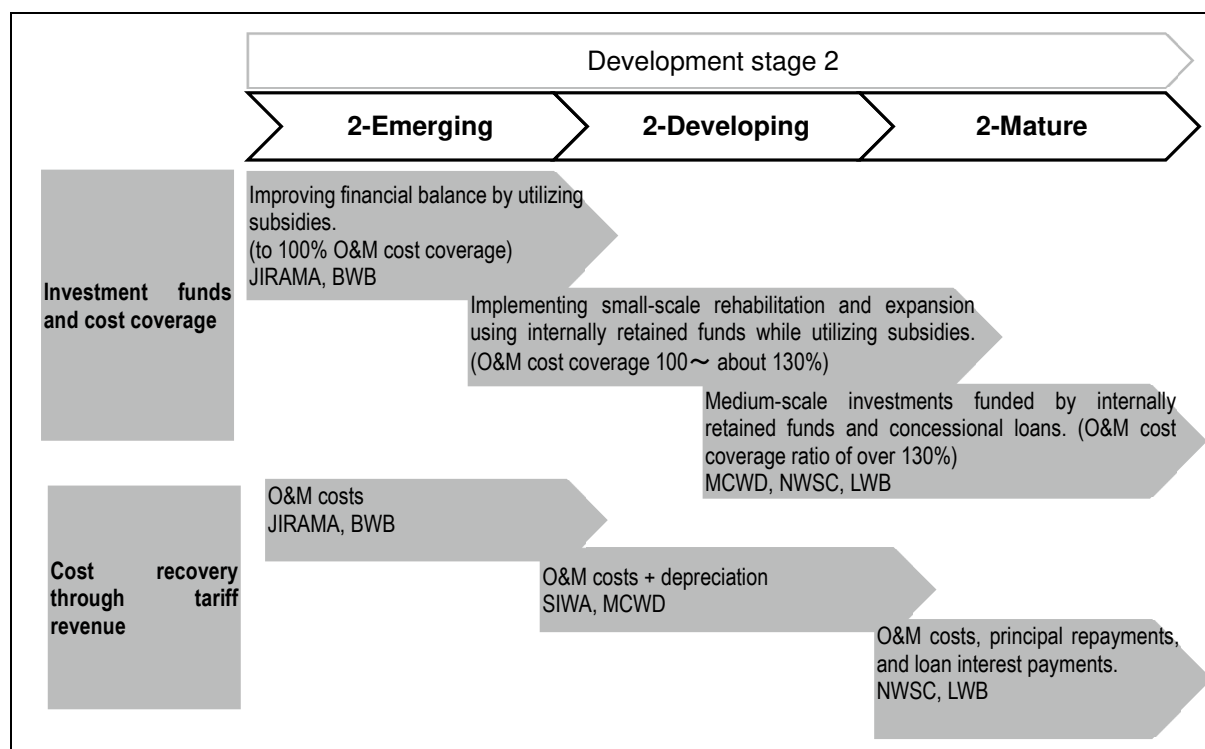


Figure 5-5 Cost Recovery Approach using O&M Cost Coverage as an Indicator

2) Target O&M cost coverage ratio and investment financing strategy

The following outlines the target O&M cost coverage ratio at each phase and the corresponding types of investment financing sources:

- Phase 2.1:
 - Target: O&M cost coverage ratio of 100%.
 - Investment Financing: Investments are primarily funded through subsidies.
- Mid-Phase of Stage 2:
 - Target: O&M cost coverage ratio of 100–130%.
 - Investment Financing: The focus is on securing funds for rehabilitation and expansion.
- Late Phase of Stage 2:
 - Target: O&M cost coverage ratio of 130% or higher.
 - Investment Financing: Sustainable investments are pursued through internally retained funds and loans.

For national utilities managing both urban and rural areas, such as NWSC, a differentiated investment strategy is recommended:

- Urban areas: The target is to achieve an O&M cost coverage ratio of 130% or higher, enabling investment through internally generated funds.
- Rural areas: Investments are made by combining subsidies and loans to ensure sustainable service expansion.

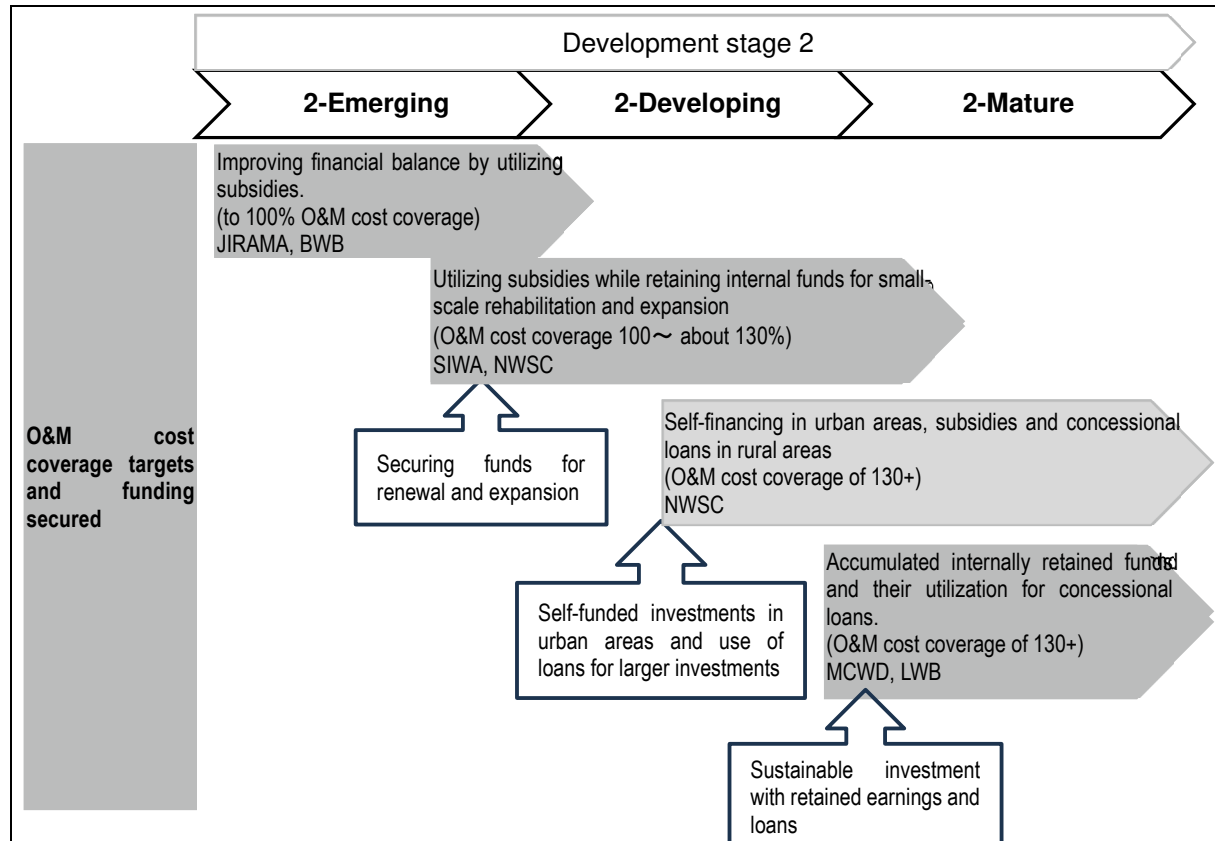


Figure 5-6 O&M cost coverage targets and approaches to securing funding

5.2.4. Implications for the approach from the survey methodology of this study

(1) Improvement of sector governance

In this study, the development stages of water utilities were identified based on Key Performance Indicators (KPIs), and a diagnostic analysis of bottlenecks for growth was conducted. This comparative analysis attracted interest from organizations such as the Uganda Ministry of Water and Environment, NWSC, the Malawi Ministry of Water and Sanitation, and LWB, which participated in the interviews. A similar approach of using KPIs for comparative analysis to identify sector challenges and explore solutions is already being implemented in Zambia and Kenya, where regulatory agencies produce annual reports on the water sector. For countries where sector governance (external governance) remains a challenge, in addition to measuring the performance of the water sector, the use of KPIs for diagnostic analysis and identification of bottlenecks for growth could be an effective tool. Such an approach could support improving sector governance by enhancing regulatory transparency and strengthening regulatory functions.

(2) Application and benefits of Diagnosis and Solution Analysis Tool

One of the most important factors in enhancing the effectiveness of the project is fostering an attitude in the business entity to take proactive steps in addressing its challenges. With this in mind, utilizing the diagnosis and solution analysis tool developed in this study will contribute to project effectiveness. The following outlines the methods for applying this tool and the benefits it generates.

1) Visualization of issue identification on the Growth Spiral

Based on the diagnostic report's 35 KPI analysis, a water utility's service and financial status can be comprehensively, quantitatively, and visually summarized on a single page. Moreover, it visually identifies which elements of the growth spiral have issues, allowing for clear pinpointing of indicators that require improvement. Simply by inputting indicator values, the utility can perform its own growth diagnosis.

2) Comprehensive analysis for identifying Growth Bottlenecks

The checklist for bottleneck analysis is structured comprehensively, ensuring that all issues faced by the water utility are thoroughly examined. In particular, clarifying external bottlenecks is crucial, as it makes potential obstacles to implementing the JICA project visible.

3) Empowering the utility to recognize its issues and take initial steps toward improvement

By reviewing the results of the growth spiral analysis and bottleneck analysis together, both the utility's executives (management) and staff develop a shared understanding of the challenges, especially those that impede growth. This shared understanding fosters more active discussions on growth initiatives.

In this study, feedback was provided to the utilities using the diagnosis and solution analysis, promoting clearer issue identification and deeper discussion. Consequently, utilities are better positioned to take action; for example, by identifying stagnant elements within the growth spiral and determining where investments should be made and where their effects will be realized.

4) Formulation of solutions based on Growth Steps

Addressing internal and external bottlenecks facilitates growth. The steps required to resolve these bottlenecks effectively serve as a roadmap for the utility's growth. In this study, these steps were visually organized to clarify which elements and indicators within the growth spiral need improvement. By formulating solutions based on these steps, utilities can directly promote their own growth.

5) Utilization and dissemination of the Growth Diagnosis and Bottleneck Analysis template

By using the growth diagnosis and bottleneck analysis template for a simplified analysis, a utility can quickly assess its growth level and identify both internal and external bottlenecks. Employing this template during the project formulation stage (detailed planning surveys) or at the project's outset and sharing the insights with the utility's management can yield several benefits:

- a) Clarification of the contribution areas of the JICA project:

Based on the utility's growth stage and identified bottlenecks, the JICA project can visually demonstrate which areas will be improved and how it will contribute to the utility's future growth.

b) Strengthening collaboration with other DPs:

By understanding which bottlenecks other DPs aim to address, the synergy (collective impact) between the JICA project and other DP projects can be maximized.

c) Enhancing project effectiveness through strengthening cross-departmental commitment:

By demonstrating the involvement of all departments (not only management but also technical, commercial, financial, and human resource development) in addressing the growth spiral and bottlenecks, and by sharing these bottlenecks and growth steps, the overall cross-departmental commitment is deepened. This enhanced commitment ultimately increases the effectiveness of the JICA project.

APPENDICES

- Appendix 1 List of References and Collected Materials
- Appendix 2 Field Survey Schedule
- Appendix 3 List of Interviewees
- Appendix 4 Monitoring Sheet
 - Appendix 4.1 Category A (14 utilities)
 - Appendix 4.2 Category B (7 utilities)
 - Appendix 4.3 Category C (6 utilities)
- Appendix 5 Excel analysis format for diagnosis of Category B
- Appendix 6 Excel analysis format for diagnosis and solutions of Category C

Annexes (Electronic Data Only):

- Annex 1 Annual Reports and Financial Statements (Categories B and C)
- Annex 2 Questionnaire Responses
 - Annex 2.1 Category B (7 utilities)
 - Annex 2.1 Category C (6 utilities)

Appendix 1 List of References and Collected Materials

No.	Document Title (URL Title)	Type
B15_Samoa_SWA		
1	Answer from Questionnaire	electronic data
2	SAMOA WATER AUTHORITY Rates & Tariffs	URL
3	Financial Statement	electronic data
B16_Bangladesh_DWASA		
1	Responses to questionnaire (19 December 2024)	electronic data
2	Annural Report 2022-2023	electronic data
3	Financial Statement	electronic data
B17_Bangladesh_RWASA		
1	Responses to questionnaire (19 December 2024)	electronic data
2	Annual report 2023	electronic data
3	Financial Statement	electronic data
B18_Bangladesh_KWASA		
	NA	
B19_Pakistan_WASA-L		
1	Answer from Questionnaire	electronic data
2	Annex 5- Tariff Notification 2023.pdf	electronic data
3	Financial Statement	electronic data
B20_Tanzania_DAWASA		
1	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23, Ministry of Energy and Energy and Water Utilities Regulatory Authority (EWURA)	electronic data
2	TZS to USD: Convert Tanzanian Shillings to US Dollars	URL
3	DAWASA Report of the controller and auditor general on the financial audit for the financial year ended 30 june 2023	electronic data
B21_Zambia_LWSC		
1	Water supply and sanitation sector report 2023	URL
2	Strategic plan 2023-2027	URL
3	Questionnaire	electronic data
4	APPROVED WATER SUPPLY AND SEWERAGE TARIFFS 2020 - 2021	electronic data
5	Annual Report 2020-2021	electronic data
C22_Philippines_MCWD		
1	2023 Utility Profile Graphs, The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in Asia	electronic data
2	MCWD Annual Report 2020	electronic data
3	MCWD Annual Report 2021	electronic data
4	MCWD Annual Report 2022	electronic data
5	MCWD Customer Satisfaction Report 2021	electronic data
6	MCWD Annual Report 2023	electronic data
7	Water balances (2021, 2022, 2023)	electronic data
8	Philippines Inflation Rate 1960-2025	URL
9	Sourcing (Opinion piece by Alex Magno)	URL
10	5. Other KPIs 2023 pbb performance-target - as of Dec 2023 (MCDC)	electronic data
C23_Solomon_SIWA		
1	IBNet	URL
2	SW's Annual Report	electronic data

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No.	Document Title (URL Title)	Type
3	Urban Water Supply and Sanitation Sector Project	URL
4	Our History - Solomon Water	URL
5	The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems	URL
6	30YearStrategicPlan-MainReport	URL
7	Questionnaire response received on Nov 4, 2024	electronic data
8	20240724 Attachment 1 Board Decision Paper Item 5.3 - SW Half-Yearly Report 1 January to 30 June 2024 - Final	electronic data
9	Answer by SIWA in Nov 2024	electronic data
10	ソロモン諸島国 水道公社無収水対策プロジェクト プロジェクト事業完了報告書（メインレポート）（2016 年）	electronic data
11	Annual Report 2021	electronic data
12	Australia and Solomon Water Celebrate Successful Completion of Panatina Borehole Project	URL
13	ソロモン国ホニアラ市及びアウキ市給水システム改善計画フォローアップ協力 (QCBS) 企画競争説明書（2020 年）	electronic data
14	SIWA Removed From SOE Standing	electronic data
15	Lilo questions removal of SIWA's SOE's status	URL
16	SIWA underperformed, removed as SOE explains Tovosia	URL
17	Solomon Water Cash Water Meter Program	URL
18	Logging in the Kongulai Water Catchment Area	URL
19	Continuous Heavy Rain Affects Kongulai Water Supply	URL
20	ソロモン諸島 ホニアラ市及びアウキ市給水システム改善計画基本設計調査報告書 (2008 年)	electronic data
21	事業評価報告書（JICA）	URL
22	ソロモン諸島 水道公社無収水対策プロジェクト 水道公社無収水対策プロジェクト 終了時評価調査報告書（2016 年）	electronic data
23	solomon-islands-independent-eval-phase-2-urban-water-program（DFAT）	electronic data
24	30YearStrategicPlanSummary	URL
25	Solomon Water Celebrates Successful Completion of Honiara Water Tank and Liner Installation Project	URL
26	ADB, World Bank, Solomon Islands Initiate Groundbreaking Water Treatment Plant Upgrade	URL
27	Urban Water Supply and Sanitation Sector Project	URL
28	Solomon Water - Home	URL
29	Solomon Islands Priority infrastructure investment pipeline 2021 Aug21_0	electronic data
30	WB Solomon Islands Urban Water Supply and Sanitation Sector Project April 2019	electronic data
31	Landmark Agreement Resolves Kongulai Disputes	electronic data
32	solomon-islands-independent-eval-phase-2-urban-water-program2016	URL
33	会計検査院による平成 30 年度決算検査報告への対応状況	electronic data
34	Energy Minister Outlines Reasons for SIWA Removal from SOE Status	URL
35	20240724 Attachment 1 Board Decision Item 5.1 - SW Organisation Reform and Transformation Report - Final	electronic data
36	20240724 Attachment 1 Board Decision Paper Item 5.3 - SW Half-Yearly Report 1 January to 30 June 2024 - Final	electronic data
37	20240724 Attachment 1 Board Decision Paper Item 5.2 - SW 5-Year Corporate Strategic Plan 2024 - 2028 - Final	electronic data
38	Questionnaire response received on Nov 4, 2024	electronic data
C24_Madagascar_JIRAMA		
1	Utility Profile Graphs	electronic data

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No.	Document Title (URL Title)	Type
2	JIRAMA's responses to this project's questionnaire recorded on 8 Nov 2024	electronic data
3	The 3rd Session of Utility to Utility Exchange JIRAMA	electronic data
4	RAPPORT D'ACTIVITES JIRAMA 2023	electronic data
5	DONNEES FINANCIERES ET EXPLPOITATION EAU JIRAMA_Eng	electronic data
6	RAPPORT D'ACTIVITES JIRAMA 2023	electronic data
7	Madagascar Inflation Rate 1965-2025 - Macrotrends	URL
8	MGA/USD Currency Exchange Rate & News - Google Finance	URL
9	環境 JR24039 調査報告書 01	electronic data
10	2022 World Bank Madagascar-National-Water-Project	electronic data
11	JICA_トアマシナ市上下水道システム拡張及び改善計画_調査報告書公開 01	electronic data
12	JIRAMA's responses to this project's questionnaire recorded on 8 Nov 2024	electronic data
13	decret_2003_791_tarifaire	electronic data
14	RAPPORT D'ACTIVITES JIRAMA 2023	electronic data
15	Madagascar Set to Expand Access to Renewable Energy and Digital Services thanks to \$400 Million Credit	URL
16	Électricité : Des coupures persistantes malgré une importante hausse de la production	URL
17	Document of The World Bank FOR OFFICIAL USE ONLY INTERNATIONAL DEVELOPMENT ASSOCIATION PROJECT APPRAISAL DOCUMENT ON A PROPOSED CREDIT IN THE AMOUNT OF SDR 51.6 MILLION (US\$75 MILLION EQUIVALENT) TO THE REPUBLIC OF MADAGASCAR FOR THE INTEGRATED URBAN DEVELOPMENT AND RESILIENCE PROJECT FOR GREATER ANTANANARIVO APRIL 26, 2018	URL
18	The World Bank in Madagascar	URL
19	Données RH (from JIRAMA)	electronic data
20	MASTER PLAN DEVELOPMENT DRINKING WATER SUPPLY FOR THE GREATER ANTANANARIVO AREA Mission report 1: Presentation and analysis of the initial situation	electronic data
21	JIRAMA Budget framing 2025	electronic data
22	Meeting with the CEO of JIRAMA on 27 Jan. 2025	electronic data
23	Meeting with the Chief Financial Officer (CFO) on 28 Jan. 2025	electronic data
24	Meeting with the Planning and the Water Project Coordinator on 27 Jan. 2025	electronic data
25	Meeting with the World Bank on 28 Jan. 2025	electronic data
C25_Uganda_NWSC		
1	Corporate-Plan-2024-2027-Final	electronic data
2	アフリカ地域「成長する水道事業体」支援におけるプラットフォーム活動情報収集確認調査 ケース事業体分析 2023 年 2 月	electronic data
3	NWSC_AmendedCorpPlan21-24_May2022	electronic data
4	ウガンダ国都市環境分野（都市給水・大気汚染）に係る情報収集・確認調査 ファイナルレポート 2021 年 11 月	electronic data
5	Performance Contract	electronic data
6	ウガンダ国「水と衛生のアフリカ域内研修ハブ強化プロジェクト (仮)」情報収集調査報告書 2024 年 6 月	electronic data
7	WaterWorX project: WOP Uganda, VEI	electronic data
8	One Million to Benefit as Government Commences UGX 373 Billion Water Project in Greater Kampala	URL
9	Water Supply & Sanitation Project Phase III - MWE	URL
10	Uganda - Water supply and sanitation programme phase III (WSSP III) - P-UG-E00-019	URL
11	WATER SUPPLY AND SANITATION PROGRAM - PHASE III - African Development Bank	URL
12	Integrated Water Management and Development Project	URL
13	Integrated urban development KfW Development Bank	URL

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No.	Document Title (URL Title)	Type
14	Integrated Programme to Improve the Living Conditions in Gulu and Small Towns en Route in the Victoria Nile Catchment (IPILC), Engineering and Institutional Consultant (EIDC) GOPA Infra	URL
15	ANALYSIS OF PHYSICAL LOSSES IN KAMPALA WATER Dr. Frank Kizito, CMAM March 2024	electronic data
16	NWSC_KW NRW Management Strategy_July 2021	electronic data
17	Profiling Our Key Development Partners and Projects Performance as of June 2024	electronic data
C26_Malawi_LWB		
1	2_1_LWB_Utility (JICA)	electronic data
2	Annual reports	electronic data
3	Quarterly & Annual Water Balance LWB: 16 Dec 2024)	electronic data
4	2022 Lilongwe Water Board Customer Satisfaction Survey	electronic data
5	Population served, the number of customers and coverage rates (LWB, received 19th Dec 2024)	electronic data
6	Final_LiSCaP terminal report_5Nov2024	electronic data
7	Project for Strengthening the Capacity of Non-Revenue Water Reduction for Lilongwe Water Board (LiSCaP), March 2022	electronic data
8	Annual Report 2021/2022	electronic data
9	LWSP – Lilongwe Water Board	URL
10	Lilongwe water and sanitation project 2017MALAWI-PAD-12012017	electronic data
11	LWB-Strategic-Plan 2020 - 2025-FINAL_3	electronic data
12	JICA2018 マラウイ国地下水開発及び無収水対策能力強化計画 準備調査報告	electronic data
13	Press Release – Financing for the Lake Malawi-Lilongwe Water Supply Project	URL
14	Khato mobilises for K551bn water project - Khato Civils	URL
15	Kamuzu I Dam (Malawi) - Studio Pietrangeli	URL
16	EIB – Lilongwe Water Board	URL
17	LILONGWE DROUGHT RESILIENCE PROGRAMME - European Investment Bank	URL
18	Development of Groundwater Resources - mitc.mw	URL
19	Commercial Bank Rates - Reserve Bank of Malawi - RBM	electronic data
20	FINAL 2024 JSR Report (1)	URL
21	The 14th joint sector review meeting report theme: "leveraging water, sanitation and hygiene for peace and well-being" 22nd to 23rd February 2024	electronic data
C27_Malawi_BWB		
1	Utility Profile, The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in Sub-Saharan Africa, March 2023	electronic data
2	The BWB Madzi newsletter Issue No002 (January -March 2024)	electronic data
3	Questionnaire answer on 3rd Dec. 2024	electronic data
4	Financial statements	electronic data
5	NRWBWB-EasyCalc2020 2021	electronic data
6	Monthly NRW Information BWB	electronic data
7	WB 2021 2022	electronic data
8	2023-2024 Customer Satisfaction Survey Final Report	electronic data
9	Malawi Inflation Rate 1981-2025 - Macrotrends	URL
10	Google Finance - Stock Market Prices, Real-time Quotes & Business News	URL
11	Blantyre Water and Sanitation Project Funded by the World Bank - BWB	URL
12	マラウイ国リロングウェ水公社への支援	URL
13	都市給水分野に係る情報収集・確認調査（QCBS）2022年2月	URL
14	WB WATER AND SANITATION PROJECT I(Feb2023)	URL
15	Future Projects - BWB	URL

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No.	Document Title (URL Title)	Type
16	GENERAL PROCUREMENT NOTICE (GPN) - BWB	URL
17	Commercial Bank Rates - Reserve Bank of Malawi - RBM	URL
18	Blantyre Water Board rationing water supply - Malawi Nyasa Times - News from Malawi about Malawi	URL
19	Answer of the Questionnaire on 3rd Dec. 2024	electronic data
20	BWB Annual Report 2023	electronic data

Appendix 2 Field Survey Schedule

(1) 1st field survey

1) Travel to Asia

Date		Schedule	Stay, transportation
10-Nov.	Sun	Depart Narita at 20:00	Overnight stay
11	Mon	Arrive Honiara at 14:15	Stay in Honiara
12	Tue.	9:00-12:00 (SIWA) Explanation and discussion on results of utility analysis 13:30-15:00 (MMERE) Explanation of results of utility analysis 16:30-17:00 ADB/DFAT	Stay in Honiara
13	Wed.	9:00-10:00 ADB/DFAT 10:30-15:00 Observation of facilities 15:00-17:00 Additional data collection, Preparation of Action Plan by JICA team	Stay in Honiara
14	Thu	9:00-12:00 Discussion on Action Plan for implementation and interview to top management 14:00-17:00 Reserve 15:30 JICA Solomon Office	Stay in Honiara
15	Fri.	11:40 Depart Honiara	Overnight stay
16	Sat.	00:20 Arrive Cebu	Stay in Cebu
17	Sun	Preparation of report	Stay in Cebu
18	Mon	At the General Manager's Office, 5th Floor, MCWD Office, 8:45 am on November 18, 2024. Explanation and discussion on results of utility analysis 14:00-17:00 (MCWD) Additional data collection and facility site observation	Stay in Cebu
19	Tue.	9:00-12:00 Discussion on Action Plan for implementation and interview to top management 14:00-17:00 Reserve	Stay in Cebu
20	Wed.	7:40 Depart Cebu and 9:05 arrive Manila 13:00-14:00 (fixed): NWRB, Ms. Susan Abano	Stay in Manila
21	Thu	9:00-10:00 Regulator (NWRB, LWUA), ADB 13:30-14:30 JICA office	Depart Manila

2) Travel to Africa

Date		Schedule	Stay
7-Dec.	Sat.	Depart Narita at 20:30	Overnight stay
8	Sun	Arrive Entebbe at 11:15	Stay in Entebbe
9	Mon	11:00-13:00 (NWSC) MD and head of services for explanation of the study and discussion on results of utility analysis (@IREC) 14:00-15:00 (NWSC) DMD Technical Services (Fixed) Head office	Stay in Entebbe
10	Tue.	9:00-10:00 (MoWE) Directorate of Water Development @DWD Boardroom on 3rd floor, at our Ministry premises in Luzira Water Utility and Regulation Department (WURD) Water and Sanitation Development Facility (WSDF) 14:00-15:00 (NWSC) Finance (to be fixed with Zaina) Mr. Aogon Silver	Stay in Entebbe
11	Wed.	10:30-12:00 (NWSC) MD and heads of services for wrap up meeting for Preparation of Action Plan (Fixed) 13:30-14:30 JICA	Stay in Entebbe

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Date		Schedule	Stay
		15:00-16:00 AFD (Fixed) (French Embassy)	
12	Thu	6:45 Leave hotel 9:55 Depart Entebbe 14:10 Arrive Lilongwe 16:30 JICA office	Stay in Lilongwe
13	Fri.	8:30 JICA 9:00-12:00 (LWB) CEO and directors for explanation and discussion on results of utility analysis (Fixed) *CEO will be there for 30min. 14:00 SCADA	Stay in Lilongwe
14	Sat.	8:10 Depart Lilongwe 8:50 Arrive Blantyre	Stay in Blantyre
15	Sun	Preparation of report	Stay in Blantyre
16	Mon	8:30 Leave for BWB 9:00-12:00 (BWB) Kick-off session with CEO, Director of Finance, Director of Technical Services, Director of Distribution and Commerce, Director of Human Resource and Administration for explanation and discussion on results of utility analysis 13:30-17:00 Observation of facilities 14:00-15:30 Finance Director 15:30-16:30 Corporate planning	Stay in Blantyre
17	Tue.	9:00-10:00 (BWB) Director of Technical Services 10:00-11:00 (BWB) Director of Finance 11:00-12:00 (BWB) Director of Distribution and Commerce 13:00-14:00 (BWB) Director of Human Resource and Administration 14:00-16:00 (BWB) Wrap up with CEO and directors	Stay in Blantyre
18	Wed.	Depart Blantyre at 9:10 Arrive Lilongwe at 9:40 11:00 (NWRA) Water Resources Management and Development Directorate, Regulatory Services Directorate, Taurus House P/Bag 363 Lilongwe 13:00-14:30 (Ministry of Water and Sanitation) Director of Water Supply, Deputy Director (Operations, Maintenance, Monitoring and Evaluation), Deputy Director (Planning, Design and Construction), Manobec House in Area 4 off Paul Kagame Highway.	Stay in Lilongwe
19	Thu	9:00-10:00 WB (Online, Fixed) 10:30-12:00 Director of Water Resources, Deputy Director of Ground Water Resources, Deputy Director of Surface Water, Deputy Director Water Quality 14:00-16:00 Observation of facilities	Stay in Lilongwe
20	Fri.	8:00-9:00 (LWB) Planning 9:00-10:00 (LWB) CEO and directors for wrap up 10:00-10:30 Water sources management 11:30-12:15 JICA Office 13:00 Leave for airport Depart Lilongwe at 16:05	Overnight stay
21	Sat.	Arrive Narita at 19:30	

(2) Second field survey

1) Travel to Asia

Date		Schedule	Stay, transportation
27-Jan	Mon	Arrive Honiara at 13:15 15:00-17:30 (SIWA) Explanation and discussion on results of updated	Stay in Honiara

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		utility analysis	
28	Tue.	9:00-12:00 (SIWA) Discussion on updated final utility analysis and data collection 15:30-16:30 JICA Solomon Office	Stay in Honiara
29	Wed.	10:50 Depart Honiara for Manila	Stay in Cebu
30	Thu	01:30 Arrive Cebu 10:00-12:00 (MCWD) Explanation and discussion on results of updated utility analysis	Stay in Cebu
31	Fri.	10:00-12:00 (MCWD) Discussion on updated final utility analysis and data collection 14:35 Depart Cebu for Manila 16:00 Arrive Manila	Stay in Manila
1-Feb.	Sat.	13:10 Depart Manil for Phom Penh	

2) Travel to Africa

Date		Schedule	Stay, transportation
21-Jan	Tuesday	Depart Narita 18:40	Overnight stay
22	Wednesday	Arrive in Lilongwe 12:50	Stay in Lilongwe
23	Thursday	10:00-11:00 Ministry of water 13:00-14:00 JICA office Leave Lilongwe at 16:00 Arrive Blantyre at 16:40	Stay in Blantyre
24	Friday	8:30-9:30 VEI 10:00-12:00 BWB Directors	Stay in Blantyre
25	Saturday	Depart Blantyre 15:10	Overnight stay
26	Sunday	Arrive in Antanarivo 13:45	Stay in Antanarivo
27	Monday	9:00-10:00 (JIRAMA) Explanation of the study with CEO 10:00-11:00 (JIRAMA) Water Production and Distribution Coordinator pi. 11:00-12:00 (JIRAMA) Pi. Water Project Coordinator/Pi. Planning Coordinator 13:30 - 14:30 (JIRAMA) Commercial and Sales Coordinator pi.	Stay in Antanarivo
28	Tuesday	8:00-9:00 (JIRAMA) Coordonnateur Finance pi. 9:30- 10:00 (JIRAMA) Customer center 10:30-11:30 (JIRAMA) Treatment plant 3:00-14:00 15:00-16:00 Director, Ministry of water Mandimbisoa	Overnight stay

Appendix 3 List of Interviewees

Water utilities and other development partner stakeholders

Ctry.	Org	Dept.	Name
Solomon.			
	Ministry of Mines, Energy and Rural Electrification (MMERE)	Director, Water Resource Division	Mr. Richard Molea
		Deputy Director, Water Resource Division	Mr. Robert Iromalefo
	Solomon Islands Water Authority (SIWA)	Chief Executive Officer (CEO)	Carmine Piantedosi
		Chief Operation Officer (COO)	Scravin Tongi
		Electrical & Mechanical Team Leader	Dany Titiri
		Coordinator	Silas Talosi
		NRW coordinator	Benjamin Billy
		Network coordinator	Lloyd Teasanau
		Water Quality Team Leader	Jae Hagabwe
		Customer Connection Coordinator	Susar Malalco
		Chief Financial Officer (CFO)	Naibulce Sige
		Senior Accountant	Norman Palmer Tahon
		Head of Corporate service	Michelle
		Manager Retail	Lucy Habu
	DFAT	Second Secretary-Infrastructure (Department of Foreign Affairs and Trade, Australia)	Ms. Kate, Chapman
ADB	Senior Country Officer, Solomon Islands Pacific Country Office	Ms. Darcy L. Tozaka	
Philippines			
	MCWD	General Manager, MCWD	Mr. Edgar H. Donoso,
		Division Manager, Corporate Planning	John Neville Macabinta
		Corporate Planning	Emmanuel Espina
		Septage and Sewerage Department	Jasher R. Engaño
		Treasury Division, Financial Management	Atty. Joan Marie T. Quiñanola
		Corporate Planning	Engr. Terrence Troy De Guzman
	National Water Resources Board (NWRB)	Chief of the Policy and Program Division	Ms. Susan Abano
	Local Water Utilities Administration (LWUA)	Division Manager, Corporate Planning	Mr. Lemuel Castro
		Department Manager, IDS	Engr. Ryan Christopher Viado
Uganda			
	NWSC	Deputy Managing Director Technical Services	Eng. Amayo Johnson.
		Senior Director Business and Scientific Services	Dr. Rose C. Kaggwa
		Manager External Services	Eng. Zainab Mpakiraba
		Director Finance Accounts and Revenue	Aogon Silver Emudong
		Principal Economist	Anna Nyadoi
		Director Internal Audit	Johnson Akanyijuka
		Director Infrastructure-Planning and Capital Development	Eng. Denis Taremwa

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Ctry.	Org	Dept.	Name
		Senior Manager Performance Monitoring and Evaluation	Eng. Tom Buyi
		Senior Director Financial Service	Francis Owot
		Director Finance Accounts and Revenue	Aogon Silver Emudong
	Ministry of Water and Environment	Commissariat WEUD	Mr Eritu Joseph
		Assistant Commissariat	Eng.Kweronda Frank
		Senior Engineer WSDF Assistant of regulation	Eng. Paul Kalo
		Senior Engineer	Eng.Kwenada Jude
		Principal Engineer	Eng.Moses Byeuir
		Senior monitoring officer (Coordinator for data)	Ronald Nyakanah
		Senior Engineer	Karamura Jude
	AFD	Programme Officer, water and sanitation, climate finance	Aya Elwattar,.
		Water and sanitation	Olivier Pannetier,.
	AfDB		Mbiro, Andrew
Malawi			
	Ministry of Water and Sanitation	Director of Water Supply Services	Mr. Prince MLETA
		Deputy Director of Operations, Maintenance, Monitoring and Evaluation	Eng. Phideria MOYO
		Director of Water Resources	Engineer James CHITETE
		SWC	Gire Phiri
		Water quality	Aubrese Plisi
		Water resources engineer	Emifa Mbewe
		Surface	Ahice Xi Magombo
		Chief ground water	Chikorm Mbemba
		Deputy director of ground water	Zixire
		Deputy Director of Water Supply Services	Mr. Thanaius
		Deputy Director	Peter Chipeta
	National Water Resources Authority (NRWA)	Surface water manager	Mussa Ching'amba
	World Bank	Senior Water Supply and Sanitation Specialist	Mr. Ivaylo Kolev
	African Development Bank	Engineer (WASH)	Ephraim Wadonda
		Senior Water and Sanitation Engineer	Mr. Lazarous Botoman PHIRI
	European Investment Bank	Public Sector Finance-East and Southern Africa	Mr. Sander Van KOOTEN
		engineer	Herald Schoellzel
	VEI	Project Manager for VEI with Southern Region Water Board and Blantyre Water Board	Ms. Dana van der Velden
	LWB	CEO	Silli Mbewe
		Director or Corporate Services	Frankie Chisambula
		Director of Finance	Steve Ottoman
		Finance Manager	Gladwell Mphande
		Management Accountant	Gift Banda
		Customer Care & Public Relations Manager	Chisomo Chibwana
		NRW Manager	Ernest Ngaivale
		Corporate Planning Manager	Hellings Nasoni
		Infrastructure Planning Engineer	Kennedy Malunga

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Ctry.	Org	Dept.	Name
		Assistant NRW PL	Lamek Dube
		GIS	Mackeanan Nyangwa
	BWB	Director of technical service	Eng. Mavuto M. Chiipanthenga
		Director of Human Resource and Administration	Mrs. Mercy Phiri
		Director of Finance	Mr Paul K.K Chiumia
		Director of distribution and customer service	Mr. Verson Julian
		SAA (site survey)	Dalifts
		Senior management accountant	Lon Zizue
		Project implementation unit	Stainley Baksto
		Manager of supply	Dalitto
		SAA (site survey)	Dalifts
Madagascar			
	MEAH: Ministère de l'Eau, de l'Assainissement et de l'Hygiène	Acting Director General	Mr. Mandimbisoa Kléoni
	WB	Sr Water & Sanitation Specialist	Pierre Francois-Xavier Boulengar
		Water & Sanitation	Jacob Gino Andrianjafy
	EIB		Samuel Robert
	JIRAMA	CEO/DG	Mr. Ron WEISS
		CFO	Jean Marie
		Senior Assistant of Sales	Sedera
		Coordinator of Water Project and planning	ANDRIAMANARIVO Hajarison
		Customer Relationship	RABELAZANDRAINY Nathalie
		Customer Relationship	RAVELONANOSY Hanitriniaina C.
		Head of Water Production	Ratsimba Heritiana Eric
		Coordinator of water operation	RAMAROSANDRATANA Rija Lalaina
		Water Planning	Rakotomanga Andrianjohary
		Chief of Water distribution	Rakotonirina Jacques Daniel
		Assistant Water Region	RANDRIANALY Andriafanamperana Nirina

Appendix 4 Monitoring Sheet

Appendix 4.1 Category A (14 utilities)

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：インド 水道事業体名：デリー水道局 (Delhi Jal Board (DJB))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	19,500,000	人	2024		https://delhi.jalboard.delhi.gov.in/jalboard/about-us	●	・水道事業の規模感を把握するための指標。 一般に水道事業体を把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数 (接続数) であるため、給水枚数 (接続数) を記載してもよい。
2		給水管及率		%				●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標。 ・計算式：給水人口 / 給水対象エリアの人口 ・普及率の定義 (分子、分母にどのような数値を用いているのか) や計算方法は要確認。
3		浄水生産能力	3,406,870	m ³ /日	2024		https://delhi.jalboard.delhi.gov.in/jalboard/about-us	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではな(時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水量が多(24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域でばらつきがある場合、●●●●●●、日ごとの値を平均した値を記載可。
5		給水水量		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「浄水出口の水質が問題ないか(浄水場での水質基準値守率)、給水枝での残留塩素濃度を確保する(給水枝での水質基準値守率、残留塩素値検出率)。数値の把握が難しい場合は定性的な評価で代替。 ・「定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「高圧や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(漏水に対する水圧について住民から苦情が発生していないか等)。
7		顧客満足度		—				●	・顧客満足度を確保するための指標。 ・「顧客が水道サービスに対して満足しているか、何に際して不満を抱えているかを確保する(定性的な評価)。 ・「水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスクープに含めることも検討する(全体の満足度に加えて、水量(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金後、項目ごとの満足度を調査)。
財務データ (経営・財務指標#14-25を自動計算)									
				単位	データ年	出典	財務項目		特記事項
a	BS	流動資産	70,704,410,695	現地通貨	2021	2021 Financial Statement	Current Assets, Loan Advances etc		
b		預現金	34,078,531,254	現地通貨	2021	2021 Financial Statement	Cash and Bank Balances		
c		固定資産	183,438,308,161	現地通貨	2021	2021 Financial Statement	Fixed Assets (including CWP)		
d		資産合計	254,142,718,856	現地通貨	2021	2021 Financial Statement	Total		
e		一年前の資産合計	218,031,484,828	現地通貨	2021	2021 Financial Statement	Total		
f		固定負債	359,082,290,165	現地通貨	2021	2021 Financial Statement	「Total Capital Funds」- 「Reserve and Surplus」-		固定負債について、BS上の数値から左記の計算で求めています。
g		有利子固定負債	340,830,419,353	現地通貨	2021	2021 Financial Statement	「Secured Loans and borrowings」+ 「Unsecured		有利子固定負債について、BS上の数値から左記の計算で求めています。
h		自己資本	-465,064,951,075	現地通貨	2021	2021 Financial Statement	「Capital Funds」+ 「Reserve and Surplus」-		自己資本について、BS上の数値から左記の計算で求めています。
i	PL	売上高	24,732,852,730	現地通貨	2021	2021 Financial Statement	TOTAL(A)		
j		営業利益	-9,882,956,865	現地通貨	2021	2021 Financial Statement	Balance being excess of Income over expenditure」-		顧客には営業利益と異なるかと思いますが、便宜上PL上の数値から左記の計算で求めています。
k		経常利益	-46,638,337,517	現地通貨	2021	2021 Financial Statement	Balance being excess of Income over expenditure		特別損益、税金費用不明のため、純利益と同じ数値を記載しています。
l		減価償却費	3,174,520,960	現地通貨	2021	2021 Financial Statement	Depreciation		
m		金融収益	246,694,067	現地通貨	2021	2021 Financial Statement	Interest earned		
n		利払い	37,002,074,719	現地通貨	2021	2021 Financial Statement	Interest		
o		補助金 (長期前受金収入)	1,908,686,000	現地通貨	2021	2021 Financial Statement	Grants/subsidies		
p		純利益	-46,638,337,517	現地通貨	2021	2021 Financial Statement	Balance being excess of Income over expenditure		
q	CF	EBITDA	-6,708,435,905	現地通貨	2021	2021 Financial Statement			
r		営業CF	N/A	現地通貨	2021	2021 Financial Statement	N/A		資料にCFが収録されていませんでした。
s		投資CF	N/A	現地通貨	2021	2021 Financial Statement	N/A		資料にCFが収録されていませんでした。
t		為替	1.7949	現地通貨/円換算レート	2024	rate202501.pdf			
経営・財務指標									
8	事業規模	会計制度	企業会計	—		ただしCFはなし		●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準		—				●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを検証し、クラスタ事業戦略のシナリオを検証する。 ・データの計算方法は、①営業利益/料金収入を有収水量で算出する方法 (日本では「供排水単価」と呼称) と、②水道料金表から標準家庭において1か月水道を利用した場合の料金を算出して、単価水量あたりの料金を求める方法がある。世帯BENETでは前者を採用し、水使用量の少ない貧困層を全額1か月1c㎡3を使用する場合の水道料金をデータベース化しているが、より標準的な使用量として1c㎡120㎡を想定して算出しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためには「目安」がよく、住民の支払い能力や支払い意志値と比較する場合にはこれが用いられる。 ・1世帯あたりの収入がある場合、水道料金負担と比較する (目安は3〜5%程度)。
10	経営状況	料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 ・ある程度に料金回収率が高い場合は、事業に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するか確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平感が生じるため、料金徴収に対する支持が得られにくくなる。
11		徴収水準		%				●	・水道事業体の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を算出して算出する。有収水量は、料金収入を投入水量で割って算出。 ・送上面では正確に計算されている事例は多くなく、精度の低い推定値である場合は「〇〇%と推定されている」と等と記述する。
12	事業規模	漏水率		%				●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、精度の低い推定値である場合は「〇〇%と推定されている」と等と記述する。
13		メーター設置率		%				●	・従量制を導入しているか、導入できる環境にあるか確認するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い層は配水に水を使えば一方、管網の末端まで配水されない)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービス)の改善に繋がり、支払い意欲が向上すると考えられる。
14	事業規模	売上高	24,733	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド/水道料金収入の成長、縮小、安定、不安定なども確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリバーリするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリバーリ可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、年給収水100m ³ あたりの給水人口150人以上と考えられる。
15		純利益	-46,638	百万現地通貨				●	・水道事業体が(特殊要因も含めて)持続的な収益力(規模)を把握するための指標。 ・純利益に関する指標 (自己資本当期純利益率、ROE、総資産当期純利益率、ROAなど) は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリバーリするためには一定以上の規模が必要と考えられる。
16		EBITDA	-6,708	百万現地通貨				※	・水道事業体ごとの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益 (Operating Profit) + 各種減価償却 (Depreciation) もしくは (Depreciation and amortization charges) ・水道事業のように設備投資が多く(償却費用)の大きい場合の収益性を分析する際に用いられる。
17		EBITDAマージン	-27%	%				※	・「運用可能なキャッシュフロー」創出能力を把握するための指標。水道事業のように設備投資が多く(償却費用)の大きい場合の収益性を分析する際に用いられる。 ・計算式：EBITDA/売上高 (Sales) または (Income) ・指標の目安：30%以上が目標 (世帯のUtility of the FutureではWorld Classの上下水道事業体の目標を30%と設定)。
18	収益性	総資産営業利益率 (ROA)	-4%	%				※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資金が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げたり、係数成果を把握する。 ・計算式：営業利益 (Operating Profit) / 総資産 (Total Assets) ・指標の目安：15%以上が目標。
19		売上高経常利益率 (長期前受金収入を除く)	-196%	%				※	・「営業活動 (水道事業) と財務活動に関する経常効率 (変動的な利益を含みない、通常の経常活動の効率) を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく(経常効率の改善を目指す)であり、係数成果を把握する。 ・計算式：(経常利益 (Ordinary Profit) - 補助金 (長期前受金収入) (Government and other grants 等)) / 売上高 (Income) ・指標の目安：15%以上が目標。
20	安全性	自己資本比率	-183%	%				※	・資金調達源 (BSの右側) の安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本 (Total Equity, Capital) / 総資産 (Total Assets) ・指標の目安：40%以上が目標 (収益性の高い事業体の場合は30%以上)。
21		固定長期適合率	-173%	%				※	・資本構成上の安全性 (固定資産を固定負債と自己資本で満たしているか) を確認する指標。長期前入金及び自己資本の範囲内の投資にない限り、水道事業は固定負債の割合が高いためである。 ・計算式：固定資産 (Non-current Assets) / (固定負債 (Non-current Liabilities) + 自己資本 (Total Equity)) ・指標の目安：100%を上回る場合は注意 (固定資産の一部を流動負債で満たしている状態)。
22		インタレストカバレッジレシオ	-0.26	倍				※	・フロー収入と、固定負債の返済に充てるための指標。償還返済能力 (利息を支払う) の利益を確保しているか) を確認。 ・計算式：(営業利益 (Operating income) + 金融収益 (Interest income) + 配当金 (Dividend income) + 支払利息 (Interest expense)) / 固定負債 (Fixed Liabilities) ・指標の目安：1.0倍を下回る場合は注意 (金融負債が営業利益を上回っている状態)。
23		EBITDA有利子負債倍率	-45.73	倍				※	・返済能力の観点から安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する平均年額を示すと解釈される。 ・計算式：(有利子負債 (Liability with interest) - 預現金 (Cash and deposits)) / EBITDA ・指標の目安：15%以下が目標 (成長ステージに依る)。
24	キャッシュフロー	フリーキャッシュフロー	#VALUE!	百万現地通貨		情報無し		※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間・成長期、プラスの場合は成熟期にあり、FCFが高水準で低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー (Cash flows from operating activities) - 投資キャッシュフロー (Cash flows from investing activities)
25		営業キャッシュフローマージン	#VALUE!	%		情報無し		※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が正しく、本指標の数値が高い場合、償還支払いが滞る(マイナスの場合は黒字倒産する)可能性がある。 ・計算式：営業CF/売上高 × 100 (%) ・指標の目安：15%以上が目安 (要精査)。
分析欄・備考欄				—	—	—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータの収集をすることを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：インド

水道事業体名：グワハティ水道局 (Guwahati Jal Board (GJB))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)		人				●	・水道事業の規模感を把握するための指標。 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水栓数(接続数)であるため、給水栓数(接続数)を記載してもよい。
2		給水管及率		%				●	・水道事業体が対象エリアの水需要を満たしているのかを把握するための指標。 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数字を用いているのか)や計算方法は要確認。
3		浄水生産能力		m ³ /日				●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、 ①配水可能な水量の絶対的に不足している、②漏水が多量に発生した場合に連続給水では漏水量が増加する、等が挙げられる。 ・給水区域が広すぎる可能性がある場合、●→●●時間/日などを補った記載も可。
5		給水水量		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準準拠中)、給水栓での残留塩素濃度を確保する(給水栓での水質基準準拠中、残留塩素濃度中)、公平の配水が難しい場合は定性的評価で代替。 ・定性的な評価として、使用者から苦情が発生していないかも確認する。
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高台や丘陵の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水栓における圧について住民から苦情が発生していないか等)。
7		顧客満足度		—				●	・顧客満足度を確保するための指標。 ・使用者が水道サービスに対して満足しているか、何に關して不満を抱えているかを確認する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する(金銭的な満足に加えて、水量(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)				単位	データ年	出典	財務項目	特記事項	
a	BS	流動資産		現地通貨					
b		現預金		現地通貨					
c		固定資産		現地通貨					
d		資産合計		現地通貨					
e		一年前の資産合計		現地通貨					
f		固定負債		現地通貨					
g		有利子固定負債		現地通貨					
h		自己資本		現地通貨					
i	PL	売上高		現地通貨					
j		営業利益		現地通貨					
k		経常利益		現地通貨					
l		減価償却費		現地通貨					
m		金融収益		現地通貨					
n		利益引当		現地通貨					
o		補助金 (長期助成金収入)		現地通貨					
p		純利益		現地通貨					
q	CF	EBITDA	0	現地通貨					
r		営業CF		現地通貨					
s		投資CF		現地通貨					
t		為替		現地通貨/ 円換算レート					
経営・財務指標									
8	経営状況	会計制度		—				●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準		—	2022	水道局ホームページ ※日本国内からはアクセス不可		●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを検証し、クラスタ事業戦略のシナリオを検証する。 ・データの計算法としては、①営業収益(料金収入を有収水量で算出(日本では「供給単価」と呼称))と、②水道料金費から標準事業額においてから水道を利用した場合の料金を算出して、差額を算出する方法がある。世間INETでは②を採用し、使用量の少ない貧困層を念頭に1か月に1m ³ を使用する場合の水道料金をデータベース化しているが、より標準的な標準量として1か月12m ³ を想定した場合で計算しているためである。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためには①がよく、住民の支払い能力や支払い意志と比較する場合には②が用いられる。 ・1世帯当たり1m ³ の収入がわかる場合、水道料金負担と比較する(目安は3～5倍程度)。
10		料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じるため、料金改定に対する支持が得られにくくなる。
11		徴収水準		%				●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入量から、料金請求対象水量(有収水量)を算出して求められる無収水量を、水道システム投入水量で割って算出。 ・送上面では正確に計算されている事例は多くなく、程度の低い推定値である場合は〇〇%と推定されている等と記述する。
12		漏水率		%					・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、程度の低い推定値である場合は〇〇%と推定されている等と記述する。
13		メーター設置率		%					・従量料金制を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では無意味な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は配水に水を使えば一方、管線の未整備に起因しない)が生じる。従量メーターを設置し従量制に移行することで、配水(水道サービスの改善)に繋がり、支払い意志が向上すると考えられる。
14		売上高	0	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストカバーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、毎給水1m ³ あたりの給水人口150人以上と考えられる。
15		純利益	0	百万現地通貨				●	・水道事業体が(特殊要因も含めて)得た総合的な収益力(損益)を把握するための指標。 ・株主利益に關する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要と考えられる。
16		EBITDA	0	百万現地通貨				※	・水道事業体などの程度のキャッシュフローを算出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各種償却費(Depreciation and amortisation charges) ・水道事業のように設備投資が多(償却費用の大きい)場合の収益力を分析する際に用いられる。
17		EBITDAマージン	#DIV/0!	%				※	・活用可能なキャッシュフロー算出能力を把握するための指標。水道事業のように設備投資が多(償却費用の大きい)場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世間のUtility of the FutureではWorld Classの上下水道事業体の指標を30%と設定。
18	収益性	総資産営業利益率(ROA)	#DIV/0!	%				※	・経営能力に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチが掲げられており、係る成果を確認する。 ・計算式：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：35%以上が目標。
19		売上高経常利益率(長期前受金収入を除く)	#DIV/0!	%				※	・営業活動(水道事業)と財務活動に關する経営効率(安定的な収益性を含めない、通常の経営活動の効率)を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく経営効率の改善を目指しており、係る成果を確認する。 ・計算式：(経常利益(Ordinary Profit)－補助金(長期前受金収入)(Government and other grants等))/売上高(Income) ・指標の目安：15%以上が目標。
20		自己資本比率	#DIV/0!	%				※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)。
21	安全性	固定長期適合率	#DIV/0!	%				※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の負債にない場合、資金調達が容易である。水道事業は固定資産の割合が大きい事業体。 ・計算式：固定資産(Non-current Assets)/(固定負債(Non-current Liabilities)+自己資本(Total Equity)) ・指標の目安：100%を上回る場合は要注意(固定資産の一部が流動負債で覆っている状態)。
22		インクレストカバレッジレシオ	#DIV/0!	倍				※	・フリーキャッシュフローの支払い能力(利益を支払うだけの利益を確保しているか)を確認。 ・計算式：(営業利益(Operating income)－金融収益(Interest income))÷配当金(Dividend income)/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。
23		EBITDA有利子負債倍率	#DIV/0!	倍				※	・資金調達の面からの安全性を把握するための指標。EBITDAはキャッシュ流出能力を意味するため、有利子負債の返済に要する平均年費を償還する。償還される。 ・計算式：(有利子負債(Liability with interest)÷償還金(Cash and deposits))/EBITDA ・指標の目安：5倍以上が目標(成長ステージに依る)。
24	キャッシュフロー	フリーキャッシュフロー	0	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities)－投資キャッシュフロー(Cash flows from investing activities)
25		営業キャッシュフローマージン	#DIV/0!	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が低くとも、本指標の数値が高い場合、償還支払いが滞る(マイナスの場合は高利得)の可能性もある。 ・計算式：営業CF/売上高×100% ・指標の目安：15%以上が目安(要調査)。
分析欄・備考欄				—	—	—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：インド

水道事業体名：アグラ水道局 (Jai Kai Vibhag Agra (JKVA))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)		人				●	・水道事業の規模感を把握するための指標 →一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数（接続数）であるため、給水枚数（接続数）を記載してもよい。
2		給水管及率		%				●	・水道事業体に対象エリアの水需要を満たしているかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義（分子、分母にどのような数字を用いているのか）や計算方法は要確認。
3		浄水生産能力		m ³ /日				●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではな（時間給水の場合、1日（または1週間）あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②給水が多量に24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域でばらつきがある場合、●●●●●●●●、日ごとの値を算出した記載も可。
5		給水水量		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「浄水場出口の水質が問題ないか（浄水場での水質基準値守率）、給水枝での残留塩素濃度を確保する（給水枝での水質基準値守率、残留塩素検出率）、配水の段階で漏れい場合定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「高台や管線の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替（例えば「給水枝における水圧について住民から苦情が発生していないか等」）。
7		顧客満足度		—				●	・顧客満足度を確保するための指標 ・「顧客が水道サービスに対して満足しているか、何に關して不満を抱えているかを確保する（定性的な評価）。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する（全体的な満足度に加えて、水量（給水時間）/水質/水圧/水道事業体の顧客対応/水道料金等、項目ごとの満足度を調査）。
財務データ（経営・財務指標#14-25を自動計算）				単位	データ年	出典	対象項目	特記事項	
a	BS	流動資産		現地通貨					
b		現預金		現地通貨					
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d		資産合計		現地通貨					
e		一年前の資産合計		現地通貨					
f		固定負債		現地通貨					
g		有利子固定負債		現地通貨					
h		自己資本		現地通貨					
i	PL	売上高		現地通貨					
j		営業利益		現地通貨					
k		経常利益		現地通貨					
l		減価償却費		現地通貨					
m		金融収益		現地通貨					
n		利益引当		現地通貨					
o		補助金 (長期前受金収入)		現地通貨					
p		純利益		現地通貨					
q	CF	EBITDA	0	現地通貨					
r		営業CF		現地通貨					
s		投資CF		現地通貨					
t		為替		現地通貨/ 円換算レート					
経営・財務指標									
8	経営状況	会計制度		—				●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準		—				●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスタ事業戦略のシナリオを検証する。 ・データの計算方法としては、①営業利益/料金収入を有収水量で算出する方法（日本では「供給水量」と呼称）と、②水道料金費から標準家庭数において1か月水道を利用した場合の料金を算出して、標準世帯あたりの料金を求める方法がある。世帯数NETではこれを採用し、水使用量の少ない貧困層を念頭に1か月に6m ³ を使用する場合の水道料金をデータベース化しているが、より標準的な使用量としては10m ³ をベースとした場合で計算しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためには①がよく、住民の支払い能力や支払い意志額と比較する場合には②が用いられる。 ・1世帯あたりの収入がわかる場合、水道料金負担と比較する（目安は3～5%程度）。
10		料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発生した水道料金の回収率に関する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するか確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じたり、料金徴収に対する支持が得られにくくなる。
11		徴収水準		%				●	・水道事業の運営能力を把握するための指標。水道システム（送配水管網）への投入水費から、料金請求対象水量（有収水量）を算出して算出する投入水費を、水道システム投入水費で割って算出。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「70%と推定されている」と等と記述する。
12		漏水率		%				●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「70%と推定されている」と等と記述する。
13		メーター設置率		%				●	・従量制を導入しているか、導入できる環境にあるかを確保するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平（浄水場や配水池に近い顧客は潔淨に水を使える一方、管線の老朽化で配水能力が低下する。顧客メーターを設置し従量制に移行することで、配水（水道サービス）の改善に繋がり、支払い意思が向上すると思われる。
14		売上高	0	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド/水道料金収入の成長、縮小、安定、不安定なども確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリバーリするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリバーリが可能な規模の目安としては、日本の水道事業体の実績をみると、給水人口10万人以上、平均配水1kmあたりの給水人口150人以上と考えられる。
15		純利益	0	百万現地通貨				●	・水道事業体の（特殊要因も含めて）得た総合的な収益力（規模）を把握するための指標。 ・純利益率に関する指標（自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど）は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリバーリするためには一定以上の規模が必要と考えられる。
16		EBITDA	0	百万現地通貨				※	・水道事業体などの程度のキャッシュフローを創出する能力（規模）があるかを把握するための指標。 ・計算式：営業利益（Operating Profit）÷各資産減価償却（Depreciationもしくは Depreciation and amortization charges） ・水道事業のように設備投資が多く（償却費用の大きい）場合の収益力を分析する際に用いられる。
17		EBITDAマージン	#DIV/0!	%				※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように設備投資が多く（償却費用の大きい）場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高（SalesまたはIncome） ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の目標を30%と設定。
18	収益性	総資産営業利益率 (ROA)	#DIV/0!	%				※	・総資産に対する収益性を把握するための指標。価値が高いほど、投資した資金が効率的に収益に貢献しているかと判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げたり、係数成果を確保する。 ・計算式：営業利益（Operating Profit）/ 総資産（Total Assets） ・指標の目安：25%以上が目標。
19		売上高経常利益率 (長期前受金収入を除く)	#DIV/0!	%				※	・営業活動（水道事業）と財務活動に関する経常効率（変動的な利益を含みない、通常の経営活動の効率）を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく（経営効率の改善を目指しており、係数成果を確保する。 ・計算式：（営業利益（Ordinary Profit）- 補助金（長期前受金収入）（Government and other grants等））/ 売上高（Income） ・指標の目安：15%以上が目標。
20	安全性	自己資本比率	#DIV/0!	%				※	・資金調達源（BSの右側）での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本（Total Equity, Capital）/ 総資産（Total Assets） ・指標の目安：40%以上が目標（収益性の高い事業体の場合は30%以上）
21		固定長期適合率	#DIV/0!	%				※	・資本構成上の安全性（固定資産を固定負債と自己資本で賄えているか）を確認する指標。長期借入金及び自己資本の範囲内の返済にないといけない場合、水道事業は固定負債の割合が大きいと要留意。 ・計算式：固定資産（Non-current Assets）/ 固定負債（Non-current Liabilities）+ 自己資本（Total Equity） ・指標の目安：100%を上回る場合は要留意（固定資産の一部を流動負債で賄っている状態）
22		インタレストカバレッジ レシオ	#DIV/0!	倍				※	・フローベースに返済能力を把握するための指標。債務返済能力（利息を支払うための利益を確保しているか）を確認。 ・計算式：（営業利益（Operating income）+ 金融収益（受取利息（Interest income）））/ 支払利息（Interest expense） ・指標の目安：1.0倍を下回る場合は要留意（金融負債が事業利益を上回っている状態）
23	キャッシュフロー	EBITDA有利子負債 倍率	#DIV/0!	倍				※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ創出力を意味するため、有利子負債の返済に要する平均年数を表すと解釈される。 ・計算式：（有利子負債（Liability with interest）+ 現金（Cash and deposits））/ EBITDA ・指標の目安：5倍以上が目標（成長ステージに依る）
24		フリーキャッシュフロー	0	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー（Cash flows from operating activities）- 投資キャッシュフロー（Cash flows from investing activities）
25		営業キャッシュフロー・ マージン	#DIV/0!	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益（PL）の数値が小さくとも、本指標の数値が高い場合、償還支払いが滞る（マイナスの場合は赤字状態）可能性がある。 ・計算式：営業CF/売上高×100 [%] ・指標の目安：15%以上が目安（要補償）
分析欄・備考欄				—	—	—			

（留意点）

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体（水道事業体成長支援型、スケールアップ支援型）については最低限必要な指標とし、データの収集を目指す。

国名：インド 水道事業体名：チェンナイ上下水道局（Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)）

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	位置付け／記入上の留意点／計算式	
水道サービス指標										
1	事業規模	給水人口（顧客数）	930,531	人	2022	11. Growth promise: No. of consumers 2023年12月時点と見られるAnnual Performance Reportでは、接続数770,292と記載	https://cmwssb.tn.gov.in/water-supply-system	●	・水道事業の規模感を把握するための指標 →一般に水道事業体を把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数（接続数）であるため、給水枚数（接続数）を記載してもよい。 ・計算式：給水人口／給水対象エリアの人口 ・普及率の定義（分子、分母にどのような数字を用いているのか）や計算方法は要確認。	
2		給水管及率	100	%	2022	11. Growth profile: Area covered with piped supply	https://cmwssb.tn.gov.in/water-supply-system	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 ・計算式：給水人口／給水対象エリアの人口 ・普及率の定義（分子、分母にどのような数字を用いているのか）や計算方法は要確認。	
3		浄水生産能力	1,510,000	m ³ /日	2023	参照したAnnual Performance Reportのp.10で、「2023年12月現在」との記載があるため、2023年度のデータと判断	https://www.cmwssb.tn.gov.in/sites/default/files/whats_new/Annual%20Performance%20Report_0.pdf	●	・水道事業の規模感を把握するための指標。	
4		給水時間		時間/日					●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 →連続給水ではなく時間給水の場合、1日（または1週間）あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多いため時間給水では漏水量が増加する、等が挙げられる。 ・給水区域でばらつきがある場合、●・●の期間／日など幅を持たせた記載も可。
5		給水水质		—	—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 →浄水場出口の水が問題ないか（浄水場での水质基準遵守）、給水栓での残留塩素濃度を確認する（給水栓での水质基準遵守、残留塩素未検出）、飲用の指標が難しい場合は定性的な評価で可。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧		—	—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 →高台や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で可（給水栓における水圧について住民から苦情が発生していないか等）。
7		顧客満足度		—	—				●	・顧客満足度を把握するための指標 →使用者が水道サービスに対して満足しているか、何に関して不満を抱えているかを把握する（定性的な評価）。 →水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコープに含めるとも検討する（全体的な満足度に加えて、水量（給水時間）・水质・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査）。
財務データ（経営・財務指標#14-25を自動計算）										
a	BS	流動資産	23,344,958,542	現地通貨	2021	2021 Financial Statement	CURRENT ASSETS LOANS/ADVANCES DEPOSITS		特記事項	
b		現預金	10,574,351,852	現地通貨	2021	2021 Financial Statement	Cash at cash equivalents as disclosed in the Balance Sheet			
c		固定資産	90,567,108,039	現地通貨	2021	2021 Financial Statement	FIXED ASSETS			
d		資産合計	113,912,066,581	現地通貨	2021	2021 Financial Statement	[TOTAL]-[ACCUMULATED DEFICIT]		BS上の数値から左記の計算	
e		一年前の資産合計	100,765,518,547	現地通貨	2021	2021 Financial Statement	[TOTAL]-[ACCUMULATED DEFICIT]		BS上の数値から左記の計算	
f		固定負債	123,454,337,268	現地通貨	2021	2021 Financial Statement	[TOTAL]-[CURRENT LIABILITIES]		BS上の数値から左記の計算	
g		有利子固定負債	19,198,794,784	現地通貨	2021	2021 Financial Statement	LONG TERM BORROWINGS			
h		自己資本	-20,037,708,239	現地通貨	2021	2021 Financial Statement	[ACCUMULATED DEFICIT] *=-1		[ACCUMULATED DEFICIT（累積赤字）]とBSの資産合計額との関係性が不明であり、これを自己資本として記載することの妥当性は要確認	
i		売上高	10,586,880,543	現地通貨	2021	2021 Financial Statement	[TOTAL]-[EXCESS OF EXPENDITURE OVER INCOME]		厳密には売上高と異なるものの、左記の計算で算出。	
j		営業利益	-956,405,744	現地通貨	2021	2021 Financial Statement	[純利益]-[金融収益]+[利払い]		厳密には営業利益と異なるものの、左記の計算で算出。	
k	PL	経常利益	-1,260,308,570	現地通貨	2021	2021 Financial Statement	[EXCESS OF EXPENDITURE OVER INCOME] *=-1		特別損益、税金費用不明のため、純利益と同じ数値を記載	
l		減価償却費	1,300,141,930	現地通貨	2021	2021 Financial Statement	Depreciation		[SCHEDULE-N PRIOR PERIOD ADJUSTMENT]にも「Depreciation」の記載があるものの詳細不明のため、合計せず	
m		金融収益	532,608,952	現地通貨	2021	2021 Financial Statement	[Interest From Bank]+[Interest from others]		[SCHEDULE-N PRIOR PERIOD ADJUSTMENT]にも「Interest」の記載があるものの詳細不明のため、合計せず	
n		利払い	836,511,778	現地通貨	2021	2021 Financial Statement	DEBT SERVICE CHARGES		[SCHEDULE-N PRIOR PERIOD ADJUSTMENT]にも「Interest」の記載があるものの詳細不明のため、合計せず	
o		補助金（長期助成金受入）	2,243,180,125	現地通貨	2021	2021 Financial Statement	GRANTS AND SUBSIDIES		[SCHEDULE-N PRIOR PERIOD ADJUSTMENT]にも「Grant」の記載があるものの詳細不明のため、合計せず	
p		純利益	-1,260,308,570	現地通貨	2021	2021 Financial Statement	[EXCESS OF EXPENDITURE OVER INCOME] *=-1			
q		EBITDA	343,736,186	現地通貨	2021	2021 Financial Statement				
r		営業CF	158,660,179	現地通貨	2021	2021 Financial Statement	Net Cash generated from operating activities			
s		投資CF	-8,148,748,733	現地通貨	2021	2021 Financial Statement	Net Cash from Investing activities			
t		為替	1,795	現地通貨/円換算レート	2024	rate202501.pdf				
経営・財務指標										
8	事業規模	会計制度	企業会計	—	—			●	・企業会計の適用有無を確認するための項目。 →成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。	
9		水道料金水準			4		https://cmwssb.tn.gov.in/general-tariff	●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水质等の改善後に料金値上げを行った場合、料金増収率に影響がないか等を確認し、クラスター事業戦略のシナリオを確認する。 →データの計算方法としては、①営業収益（料金収入）を有収水量で割る方法（日本では「総料金/有収水量」と呼ぶ）、②水道料金表から標準率に対して（有収水量を利用した場合の料金を算出して、有収水量あたりの料金を求める方法）がある。左記BINETでは前者を採用し、水使用量の少ない集約圏を全額に10月16m3を使用する場合の水道料金をデータベース化しているが、より標準的な方法で配水されないが生じ、顧客メーターを設置し従量制に移行することで、配水（水道サービス）の改善に繋がり、支払い負担が低くなると思われる。 →用途を問わず、水道事業体として水道料金水準を把握するための①は①より、住民の支払い能力や支払い意思額と比較する場合には②が適用される。 →1世帯当たりの収入がわかる場合、水道料金負担と比較する（目安は①>5%程度）。	
10		料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 →ある期間に発生した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 →給水時間、給水圧、給水水质等の改善や従量制への移行によって向上するか確認し、クラスター事業戦略のシナリオを確認する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平感が生じるため、料金改定に対する支持が得られにくくなる。	
11		徴収水準		%				●	・水道事業の運営能力を把握するための指標。水道システム（送配水管網）への投入水量から、料金請求対象水量（有収水量）を差し引いて求められる徴収水準を、水道システム投入水量で割って算出。 →地上国では正確に計算されている事例は多くなく、精度の低い「推定値である」という場合は「〇〇%と推定されている」と等と記述する。	
12		漏水率		%				●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 →地上国では正確に計算されている事例は多くなく、精度の低い「推定値である」という場合は「〇〇%と推定されている」と等と記述する。	
13		メーター設置率	3.12	%	2023	参照したAnnual Performance Reportのp.10で、「2023年12月現在」との記載があるため、2023年度のデータと判断	https://www.cmwssb.tn.gov.in/sites/default/files/whats_new/Annual%20Performance%20Report_0.pdf	●	・従量制を導入しているか、導入できる環境にあるかを把握するための指標。 →定額制では無駄な水利用が発生し、それに起因して配水の不公平（浄水場や配水池に近い顧客は濃度的に水を使える一方、管網の末端まで配水されないが生じ）、顧客メーターを設置し従量制に移行することで、配水（水道サービス）の改善に繋がり、支払い負担が低くなると思われる。	
14		売上高	10,587 19,002	百万現地通貨 百万円				●	・水道事業の規模感を把握するための指標。過去のトレンド（水道料金収入の成長、縮小、安定、不安定など）も確認する。 →水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリカバリーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、送水配水距離100km以上の給水人口150人以上と等とされる。	
15		純利益	-1,260 -2,262	百万現地通貨 百万円				●	・水道事業体が（特殊要因も含めて）得た総合的な収益力（規模）を把握するための指標。 →総利益率に関する指標（自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど）は収益性を把握するデータとして良く利用される。 →水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要と考えられる。	
16		EBITDA	344 617	百万現地通貨 百万円				※	・水道事業体などの程度のキャッシュフローを算出する能力（規模）があるかを把握するための指標。 →計算式：営業利益（Operating Profit）÷各種償却費（Depreciation もしくは Depreciation and amortisation charges） →水道事業のように設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。	
17		EBITDAマージン	3%	%				※	・活用可能なキャッシュフロー側能力を把握するための指標。水道事業のよう設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。 →計算式：EBITDA／売上高（Sales）またはIncome →指標の目安：30%以上が目標。世銀のUtility of the FutureではWorld Classの上下水道事業体の間値を30%と設定。	
18	収益性	総資産営業利益率（ROA）	-1%	%				※	→総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスター事業戦略において、資産規模を増やし、収益性を高めるアプローチを掲げている、係る成果を確認する。 →計算式：営業利益（Operating Profit）／総資産（Total Assets） →指標の目安：5%以上が目標。	
19		売上高経常利益率（長期前受金受入を除く）	-33%	%				※	→営業活動（水道事業）と財務活動に関する経営効率（突発的な損益を含まない、通常の経営活動の効率）を把握するための指標。クラスター事業戦略では、規模を上げるだけでなく経営効率の改善を目指しており、係る成果を確認する。 →計算式：（経常利益（Ordinary Profit）÷総資産（長期前受金受入）（Government and other grants等））／売上高（Income） →指標の目安：15%以上が目標。	
20		自己資本比率	-19%	%				※	→資金調達源（BSの右側）での安全性を把握するための指標。数値が高いほど経営が安定している。 →計算式：自己資本（Total Equity Capital）／総資産（Total Assets） →指標の目安：40%以上が目標（収益性の高い事業体の場合は30%以上）	
21	安全性	固定長期適合率	88%	%				※	→資本構成上の安全性（固定資産を固定負債と自己資本で賄えているか）を確認する指標。長期前入金及び自己資本の範囲内の投資になっている場合、資金繰りが圧迫される。水道事業は固定資産の割合が大きいため注意要。 →計算式：固定資産（Fixed Assets）／（固定負債（Non-current Liabilities）+自己資本（Total Equity）） →指標の目安：100%以上が目標（固定資産の一部を固定負債で賄っている状態）	
22		インデブツ・カバレッジ・レシオ	-0.51	倍				※	→フロー面から見た安全性を把握するための指標。債務返済能力（利息を支払うだけの利益を獲得しているか）を確認。 →計算式：（営業利益（Operating income）+金融収益（受取利息（Interest income）+配当金（Dividend income））／支払利息（Interest expense） →指標の目安：1.0倍を下回る場合は注意要（金融費用が事業利益を上回っている状態）	
23		EBITDA有利子負債倍率	25.09	倍				※	→資金繰りの観点から安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する平均年率を予測する指標である。 →計算式：（有利子負債（Liability with interest）-現預金（Cash and deposits））／EBITDA →指標の目安：1倍以下が目標（成長ステージに依存）	
24	キャッシュフロー	フリーキャッシュフロー	-7,989.09 -14,338.38	百万現地通貨 百万円				※	→水道事業体のキャッシュフローを把握するための指標。マイナスの場合は借入期間→成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて後退期にあると考えられる。 →計算式：営業キャッシュフロー（Cash flows from operating activities）-投資キャッシュフロー（Cash flows from investing activities）	
25		営業キャッシュフロー・マージン	1.51%	%				※	→売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益率（PLの数値）が高くとも、本指標の数値が低い場合、債務支払いが滞る（マイナスの数値は半導体産業）の可能性があり。 →計算式：営業CF／売上高×100％ →指標の目安：15%以上が目安（業種差）	
分析欄・備考欄										

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体（水道事業体成長支援型、スケールアップ支援型）については最低限必要な指標とし、データの収集を目指す。

「JICAグローバル・アジェンダ」持続可能な水資源の確保と水供給」 クラスター事業戦略「水道事業体成長支援」モニタリングシート

国名：インド

水道事業体名：ベンガール上下水道局(Bangalore Water Supply and Sewerage Board (BWSSB))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式	
水道サービス指標										
1	事業規模	給水人口 (顧客数)	12,900,000	人	2024		https://bwssb.karnataka.gov.in/info-1/About+BWSSB/en	●	・水道事業の規模感を把握するための指標 → 一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。	
2		給水管及事		%				●	・水道事業体が対象エリアの水需要を満たせているのかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母)にどのような数字を用いているのかや計算方法は要確認。	
3		浄水生産能力	1,450,000	m ³ /日	2024		https://bwssb.karnataka.gov.in/info-1/About+BWSSB/en	●	・水道事業の規模感を把握するための指標。	
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではない(停断給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、停断給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多く24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域中ではばらつきがある場合、●→●時間/日など幅を持たせた記載も可。	
5		給水水質		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準値守率)、給水栓での残留塩素濃度を確保する(給水栓での水質基準値守率、残留塩素検出率)、数字の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。	
6		給水圧		—					●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高台や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について住民から苦情が発生していないか等)。
7		顧客満足度		—					●	・顧客満足度を確保するための指標 ・使用者が水道サービスに対して満足しているか、何に不満を抱えているかを確認する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスクリーン1に含めることと検討する(全体の満足度に加えて、水質(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)
財務データ(経営・財務指標#14-25を自動計算)										
				単位	データ年		出典	財務項目	特記事項	
a	BS	流動資産		現地通貨						
b		現金		現地通貨						
c		固定資産		現地通貨						
d		資産合計		現地通貨						
e		一年前の資産合計		現地通貨						
f		固定負債		現地通貨						
g		有利子固定負債		現地通貨						
h	PL	自己資本		現地通貨						
i		売上高		現地通貨						
j		営業利益		現地通貨						
k		経常利益		現地通貨						
l		減価償却費		現地通貨						
m		金融収益		現地通貨						
n		利払い		現地通貨						
o	CF	補助金 (長期前受金戻入)		現地通貨						
p		純利益		現地通貨						
q	CF	EBITDA	0	現地通貨						
r		営業CF		現地通貨						
s		投資CF		現地通貨						
t		為替		現地通貨/円換						
経営・財務指標										
8	事業状況	会計制度		—				●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。	
9		水道料金水準		—				●	・水道料金水準が適切に設定されているかを確認するための指標。給水時間、給水人口、給水水質等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスター事業戦略のシナリオを検証する。 ・データの計算方法としては、①営業収益(料金収入)を有収水量で割る方法(日本では「供給標準」と呼称)と、②水道料金表から標準水量において1か月水利用した場合の料金を算出して、単位水当あたりの料金を求める方法がある。世帯あたりでは2を採用し、水使用量の少ない貧困層を多量に1か月6m ³ を使用する場合の水道料金をデータベース化しているが、より標準的な使用量として1か月20m ³ を使用した場合で計算しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金を把握するためには①がよく、住民の支払い能力や支払い意欲と比較する場合には②が用いられる。 ・1世帯あたりの収入がわかる場合、水道料金負担と比較する(目安は30～54程度)。	
10		料金徴収率		%				●	・水道事業体の料金徴収能力を確認するための指標。 ・ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水人口、給水水質等の改善や収支管理への移行によって向上するかを確認し、クラスター事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平感が生じるため、料金改定に対する支持が得られにくくなる。	
11		無収水準		%				●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を差し引いて求められる無収水量を、水道システム投入水量で割って算出。 ・地上国では正確に計算されている事例は多くなく、精度の低い推定値であるその場合は「〇〇%と推定されている」等と記述する。	
12		漏水率		%				●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・地上国では正確に計算されている事例は多くなく、精度の低い推定値であるその場合は「〇〇%と推定されている」等と記述する。	
13		メーター設置率		%				●	・従量料金制を導入しているか、導入できる環境にあるかを確保するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は配水池に近い水を使える一方、管網の末端まで配水されない)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービスの改善)に繋がりが、支払い意欲が向上すると考えられる。	
14		事業規模	売上高	0 百万現地通貨					●	・水道事業体の規模を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリターンするためには一定以上の規模が必要となる。施設費用を含めて水道料金コストリターンが可能な規模の目安として、日本では水道事業体の実績を踏まえて、給水人口10万人以上、送配水管1kmあたりの給水人口150人以上と考える。
15	純利益		0 百万現地通貨					●	・水道事業体が(特許収入も含めて)得た総合的な収益力(損益)を把握するための指標。 ・純利益に関する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリターンするためには一定以上の規模が必要と考えられる。	
16	EBITDA		0 百万現地通貨					※	・水道事業体ごとの経営のキャッシュフローを割出す能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各種償却費(Depreciation しくは Depreciation and amortization charges) ・水道事業のよう設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。	
17	収益性	EBITDAマージン	#DIV/0!	%				※	・活用可能なキャッシュフロー割出能力を把握するための指標。水道事業のように設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the Future ではWorld Classの上下水道事業体の指標を30%と設定。	
18		総資産営業利益率(ROA)	#DIV/0!	%				※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献しているかと判断できる。クラスター事業戦略において、資産規模を増やし収益性を高めるアプローチを掲げおり、係る成果を確認する。 ・計算式：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：5%以上が目標。	
19		売上高経常利益率(長期前受金戻入を除く)	#DIV/0!	%				※	・営業活動(水道事業)と財務活動に関する経営効率(安定的な損益を含まない、通常の経営活動の効率)を把握するための指標。クラスター事業戦略では、規模を上げただけでなく経営効率の改善を目指しており、係る成果を確認する。 ・計算式：(経常利益(Ordinary Profit)-補助金(長期前受金戻入)(Government and other grants等))/売上高(Income) ・指標の目安：15%以上が目標。	
20	安全性	自己資本比率	#DIV/0!	%				※	・資金調達面(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)。	
21		固定長期適合率	#DIV/0!	%				※	・資本規模上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の返済計画について、資金確保が図られる。水道事業は固定資産の割合が大きい産業。 ・計算式：固定資産(Non-current Assets)/(固定負債(Non-current Liabilities)+自己資本(Total Equity)) ・指標の目安：100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)。	
22		インタレストカバーレージ	#DIV/0!	倍				※	・フロー面から見た安全性を把握するための指標。債務返済能力(利息を支払うだけの利益を確保しているか)を確認。 ・計算式：(営業利益(Operating income)+金融収益(受取利息(Interest income)+配当金(Dividend income)+支払利息(Interest expense)) ・指標の目安：1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。	
23	キャッシュフロー	EBITDA有利子負債倍率	#DIV/0!	倍				※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ割出能力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式：有利子負債(Liability with interest)-預当金(Cash and deposits)/EBITDA ・指標の目安：1.0倍以下が目標(返済コストが低くなる)。	
24		フリーキャッシュフロー	0 百万現地通貨					※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)	
25		営業キャッシュフロー・マージン	#DIV/0!	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PLの数値)が高くと、本指標の数値が高い場合、債務支払いが滞る(マイナスの場合は赤字発生)可能性がある。 ・計算式：営業CF/売上高×100 (%) ・指標の目安：15%以上が目安(要精査)。	
分析欄・備考欄				—	—		—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標として、データの収集を目指す。

国名:トルコ 水道事業体名:アンカラ下水道局(Ankara Water and Sewerage Administration (ASKİ))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリ に必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	5,803,482 (2,600,531)	人	2024.10	2025 Yılı Performans Programı p.12, 57 参照	https://www.aski.gov.tr/TR/ICERIK/Performans-Programlari/23	●	・水道事業の規模感を把握するための指標 →既に水道事業体が把握しているものは、水道利用人口ではなく、料金徴収の単位である給水枝数(接続数)であるため、給水枝数(接続数)を記載してもよい。
2		給水普及率		%				●	・水道事業が対象エリアの水需要を満たしているかを把握するための指標 ・計算式: 給水人口/給水対象エリアの人口 普及率の定義(分子、分母にどのような数値を用いているか)や計算方法は要確認。
3		浄水生産能力	1,692,000	m ³ /日	2024	生産水量実績1,692,000m ³ /日 2025 Yılı Performans Programı p.21 参照	https://www.aski.gov.tr/TR/ICERIK/Performans-Programlari/23	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・運転継続できない時間給水の場合、1日(または1週間)あたりの給水時間を把握。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水量が多(4時間給水では漏水量が増加する、等が挙げられる。 ・給水地域中でばらつきがある場合、●→時間/日など単位を持たせた記載可。
5		給水水質	全項目、水質に問題なし	—	2024.9	水質センターにて分析、 TS 266(トルコ基準)、GHQ基準に準拠 2025 Yılı Performans Programı p.52 参照	https://aski.gov.tr/TR/SuKaliteSonuclari.aspx	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場の出口の水質に関する(1)浄水場での水質基準事項、給水途中で汚染物質濃度を把握する(給水栓での水質基準遵守率、残留塩素検出率)、数字の把握が難しい場合は定性的な評価で代替。 ・「定性的な評価」として、使用者から苦情が発生していないか等も確認する。
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高圧や管網の破損など、水圧が最も低い点をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について住民から苦情が発生していないか等)。
7		顧客満足度	加入者苦情解決率90%		2025	2025 Yılı Performans Programı p.77 参照		●	・顧客満足度を把握するための指標 ・「使用者が水道サービスに対して満足しているか、何に関して不満を抱えているかを確認する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する(金銭的な満足度に加えて、水量(給水時間)、水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)
財務データ(経営・財務指標#14-25を自動計算)									
				単位	データ年		出典	財務項目	特記事項
a	BS	流動資産		現地通貨					
b		預現金		現地通貨					
c		固定資産		現地通貨					
d		資産合計		現地通貨					
e		一年前の資産合計		現地通貨					
f		固定負債		現地通貨					
g		有利子固定負債		現地通貨					
h		自己資本		現地通貨					
i		売上高		現地通貨					
j		営業利益		現地通貨					
k	PL	経常利益		現地通貨					
l		減価償却費		現地通貨					
m		金融収益		現地通貨					
n		利払い		現地通貨					
o		補助金 (長期前受金収入)		現地通貨					
p	CF	純利益		現地通貨					
q		EBITDA	0	現地通貨					
r		営業CF		現地通貨					
s		投資CF		現地通貨					
t		為替		現地通貨/円換算					
経営・財務指標									
8	会計制度	会計制度	2560号設立法第9条: 水道料金の決定は、ASKİ総局の管理委員会の決定後に自治体議会で議決される。 徴収(5月および11月)に特別議決で総会が解雇される可能性がある。 2560号第23条: 水道料金はコストを下回る価格で販売できない。 1. 一般住宅 0~15 m ² : 26.88 16~30 m ² : 37.62 30 m ² <: 48.66 2. 社会支援を受け住宅 0~10 m ² : 1.00 11~15 m ² : 26.88 16~30 m ² : 37.62 3. 企業、産業、商業施設: 45.66 4. 公的機関・特殊施設 公的機関: 40.32 公園・スポーツ施設: 44.88	—		設立法2560号に準拠 https://mevzuat.gov.tr/MevzuatMetni/1.5.2550.pdf?utm_source=tegitel.com	ALMANAK2022 https://yayinlar.aski.gov.tr/78-aski-almanak-2022-dergi.asp#ilder/resim/99	●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理・できていく必要あり。
9		水道料金水準	TL/m ³	2024.12	2560号設立法第9条: 水道料金の決定は、ASKİ総局の管理委員会の決定後に自治体議会で議決される。	https://www.aski.gov.tr/tr/ucretler.aspx	●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水質等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスタ事業戦略のシナリオを構築する。 ・「データの計算方法」としては、①営業収益(料金収入)÷有収水量で算出する方法(日本では(供給単価)と呼称)と、②水道料金数から顧客数(または人口)を算出して、料金÷顧客数で算出する。顧客数あたりの料金を求める方法がある。世帯当たりでは②を採用し、水使用量の少ない賃貸住宅を念頭に1ヶ月に2回使用する場合は水道料金をデータベース化しているが、より確率的な「用途」を問わず、水道事業体全体としての水道料金水準を把握するためには①がよく、住民の支払い能力や支払い意欲と比較する場合には②が用いられる。 ・「顧客当たりの収入がわかる場合、水道料金負担と比較する(目安:23~25程度)。	
10	経営状況	料金徴収率	98.28	%	2023	2023 YILI FAALİYET RAPORU p104 参照	https://www.aski.gov.tr/TR/ICERIK/Faaliyet-Raporlari/26	●	・水道事業体の料金回収能力を確認するための指標。 ・「決算期に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率」。 ・「徴収率が高い場合、料金支払いの有無で顧客間に不公平が生じるため、料金改定に対する支持が得られにくくなる。
11		徴収水準	42	%	2025	2025 Yılı Performans Programı p.65 参照	https://www.aski.gov.tr/TR/ICERIK/Performans-Programlari/23	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を算出して求めらる徴収水量を、水道システム投入水量で割って算出。 ・売上高では正確に計算されている事例は多く、精度の高い指標であるその場合は70%と設定されている。等と記述する。
12		漏水率		%				●	・「無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・「漏水率は正確に計算されている事例は多く、精度の高い指標であるその場合は70%と設定されている。等と記述する。
13		メーター設置率		%				●	・「促進料金を導入しているか、導入できる理由:あるかを把握するための指標。 ・「定額制では無効な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は配水池に水を運べる一方、管網の末端まで配水されない)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービス)の改善に繋がり、支払い意欲が向上すると考えられる。
14	事業規模	売上高	0 0 0 0 0	百万現地通貨 百万円				●	・水道事業体の規模を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・「水道事業は資本集約的な産業であり、水道料金のみでコスト/リカバーするためには一定以上の規模が必要となる。施設使用を含めて水道料金でコスト/リカバーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、導水配水管1mmあたりの給水人口100人以上以上と考える。
15		純利益	0 0 0 0 0	百万現地通貨 百万円				●	・水道事業体が(特殊要因も含めて)得た総合的な収益力(損益)を把握するための指標。 ・「純利益」に関する指標(自己資本当期純利益率・ROE、経営資本当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコスト/リカバーするためには一定以上の規模が必要と考えられる。
16		EBITDA	0 0 0 0 0	百万現地通貨 百万円				※	・水道事業体などの程度のキャッシュフローを創出する能力(損益)があるかを把握するための指標。 ・計算式: 営業利益(Operating Profit)/各種減価償却費(Depreciationもしくは Depreciation and amortisation charges) ・水道事業のように設備投資が多く償却費の大きい場合は収益性を分析する際に用いられる。
17		EBITDAマージン	#DIV/0!	%				※	・「通常可能なキャッシュフロー創出能力を把握するための指標。水道事業のように設備投資が多く償却費負担の大きい場合の収益性を分析する際に用いられる。 ・計算式: EBITDA/売上高(SalesまたはIncome) ・「指標の目安: 30%以上が目標。世帯のLiquidity of the FutureではWorld Classの上下水道事業体の間を30%と設定。
18		収益性	総資産営業利益率(ROA)	#DIV/0!	%			※	・「顧客度に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献している判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げている、係る成果を確認する。 ・計算式: 営業利益(Operating Profit)/ 総資産 (Total Assets) ・「指標の目安: 15%以上が目標。
19	安全性	売上高経常利益率(長期前受金収入を除く)	#DIV/0!	%				※	・「営業活動(水道事業)と財務活動に関する経営効率(安定的な収益性を含まない、通常の経営活動の効率)を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく(経営効率の改善を目指しており、係る成果を確認する。 ・計算式: (経常利益 (Ordinary Profit)-補助金(長期前受金収入)(Government and other grants))/売上高 (Income) ・「指標の目安: 15%以上が目標。
20		自己資本比率	#DIV/0!	%				※	・「資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式: 自己資本 (Total Equity, Capital) /総資産 (Total Assets) ・「指標の目安: 40%以上が目標(収益性の高い事業体の場合は50%以上)。
21		固定長期適合率	#DIV/0!	%				※	・「資本構成上の安全性(固定資産を固定負債と自己資本で支えている)を確認する指標。長期前受金及び自己資本の範囲内の投資になっている場合、資金繰りが圧迫される。水道事業は固定資産の割合が大きいため注意。 ・計算式: 固定資産 (Non-current Assets)/固定負債 (Non-current Liabilities) + 自己資本 (Total Equity) ・「指標の目安: 100%以上が目標(安全性の高い事業体の場合は100%以上)。
22		インタレストカバレッジレシオ	#DIV/0!	倍				※	・「フロー面から見た安全性を把握するための指標。債務返済能力(利息を支払うだけの利益を獲得しているか)を確認。 ・計算式: (営業利益 (Operating Profit) + 金融収益 (Interest Income) + 配当金 (Dividend Income)) / 支払利息 (Interest Expenses) ・「指標の目安: 1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。
23		EBITDA/有利子負債比率	#DIV/0!	倍				※	・「資金繰りの観点からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する年次償還を上回る。
24	キャッシュフロー	フリーキャッシュフロー	0 0	百万現地通貨 百万円				※	・水道事業体の成長率(キャッシュ)を把握するための指標。マイナスの場合は短期間→成長期、プラスの場合は成熟期/RFが減少率から出ている場合、成長期を過ぎて衰退期にあると考えられる。 ・計算式: 営業キャッシュフロー (Cash flows from operating activities)-投資キャッシュフロー (Cash flows from investing activities)
25		営業キャッシュフローマージン	#DIV/0!	%				※	・「売上に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益率(PLの動向)が最も、本指標の数値が低い場合、債務支払いが滞る(マイナスの場合は黒字割定)も考えられる。 ・計算式: 営業CF/売上高 × 100 (%) ・「指標の目安: 15%以上が目標(営業)
分析欄・備考欄									

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目的とする。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スモールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

参考文献

a) イラク国ワルド地域上水道セクターにおける新規事業調査 水道施設運転管理、維持管理現地調査報告書
b) 2023.10.11 イラクEWSD(製造業資料)

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

（留意点）

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体（水道事業体成長支援型、スケールアップ支援型）については最低限必要な指標とし、データの収集を目指す。

水道事業体名:フェズ電力上下水道公社 (Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Fès (RADEEF))									
No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	
位置付け／記入上の留意点／計算式									
水道サービス指標									
1	事業規模	給水人口 (顧客数)		人				●	
2		給水管及率		%				●	
3		浄水生産能力		m ³ /日				●	
4	サービス水準	給水時間		時間/日				●	
5		給水水质		—				●	
6		給水圧		—				●	
7		顧客満足度		—				●	
財務データ(経営・財務指標#14-25を自動計算)									
a	BS	流動資産		現地通貨					
b		現金		現地通貨					
c		固定資産		現地通貨					
d		資産合計		現地通貨					
e		一年前の資産合計		現地通貨					
f		固定負債		現地通貨					
g		有利子固定負債		現地通貨					
h		自己資本		現地通貨					
i	PL	売上高		現地通貨					
j		営業利益		現地通貨					
k		経常利益		現地通貨					
l		減価償却費		現地通貨					
m		金融収益		現地通貨					
n		利払い		現地通貨					
o		補助金 (長期前受金戻入)		現地通貨					
p		純利益		現地通貨					
q	CF	EBITDA	0	現地通貨					
r		営業CF		現地通貨					
s		投資CF		現地通貨					
t		為替		現地通貨/円換					
経営・財務指標									
8	経営状況	会計制度		—				●	
9		水道料金水準		—				●	
10		料金徴収率		%				●	
11		無収水準		%				●	
12		漏水率		%				●	
13		メーター設置率		%				●	
14		事業規模	売上高	0	百万現地通貨				●
15			純利益	0	百万現地通貨				●
16			EBITDA	0	百万現地通貨				※
17		収益性	EBITDAマージン	#DIV/0!	%				※
18	総資産営業利益率 (ROA)		#DIV/0!	%				※	
19	売上高経常利益率 (長期前受金戻入を除く)		#DIV/0!	%				※	
20	自己資本比率		#DIV/0!	%				※	
21	固定長期適合率		#DIV/0!	%				※	
22	インタレストカバレッジ レシオ		#DIV/0!	倍				※	
23	EBITDA有利子負債 倍率		#DIV/0!	倍				※	
24	キャッシュフロー			0	百万現地通貨				※
25	営業キャッシュフロー・ マージン	#DIV/0!	%					※	
分析・備考欄									

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標と、データの収集を目指す。

国名:モロッコ

水道事業体名:メクネス電力上下水道公社(Régie Autonome Intercommunale de Distribution d'Eau et d'Électricité de Meknès (RADEEM))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに留意	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	総人口 (顧客数)	771,655	人	2020	接続人口	Annual Report 2020 p.29	●	・水道事業の規模感を把握するための指標。 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水栓数(接続数)であるため、給水栓数(接続数)を記載してもよい。
2		給水管及率	100	%	2020	接続率99.1%	Annual Report 2020, p.4	●	・水道事業体が対象エリアの水需要を満たしているのかを把握するための指標。 ・計算式: 給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母)にどのような数字を用いているのかや計算方法は要確認。
3		浄水生産能力	122,060 (給水タンク容量)	m ³ /日	2020	配水池9基	Annual Report 2020, p.4, 26	●	・水道事業の規模感を把握するための指標。
4		給水時間	24	時間/日	2020		Annual Report 2020, p.4, 26 https://www.radem.ma/Radem/	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・運転給水ではない時間帯の緊急時の対応の給水時間を把握し、一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水量が多(24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域中ではらつぎがある場合、●～●時間/日などを付した記載も可。
5		給水水量	100	%	2020	遵守率100%	Annual Report 2020, p.4	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水出口の水質が問題ない(汚水場での水質基準遵守率)、給水栓での汚損発生率を確認する(給水栓での水質基準遵守率、汚損発生率)。数字の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧	—	—	—	—	—	●	・顧客満足度を把握するための指標。 ・高圧や管網の末端など、水圧が最も低い箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について住民から苦情が発生していないか等)。
7		顧客満足度	—	—	—	—	—	●	・顧客満足度を把握するための指標。 ・使用者が水道サービスに対して満足しているか、何に關して不満を抱えているかを把握する(定性的な評価)。 ・水道サービスの改善が期待できる案件については、顧客満足度調査をプロジェクトのスクープに含めることも検討する(定量的な満足度に加えて、水量(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)									
			単位	データ取得年	出典		財務項目		特記事項
a	BS	流動資産	942,865	現地通貨	2020	2020 Financial Statement	「TOTAL」-「IMMOBILISATIONS」	BS上の数値から左記の計算で算出	
b		預当金	280,750	現地通貨	2020	2020 Financial Statement	TRESORERIE		
c		固定資産	1,695,776	現地通貨	2020	2020 Financial Statement	IMMOBILISATIONS		
d		資産合計	2,638,641	現地通貨	2020	2020 Financial Statement	TOTAL		
e		一年前の資産合計	N/A	現地通貨	2020	2020 Financial Statement	N/A	「BS推移」に2019の数値の記載があるものの、2020の「流動資産」+「固定資産」が「BS」の「資産Total」と一致していないため計算	
f		固定負債	N/A	現地通貨	2020	2020 Financial Statement	N/A	情報無し	
g		有利子固定負債	N/A	現地通貨	2020	2020 Financial Statement	N/A	情報無し	
h		自己資本	1,489,557	現地通貨	2020	2020 Financial Statement	CAPITAUX		
i	PL	売上高	914,369	現地通貨	2020	2020 Financial Statement	TOTAL I		
j		営業利益	-65,911	現地通貨	2020	2020 Financial Statement	RESULTAT D'EXPLOITATION		
k		経常利益	-61,789	現地通貨	2020	2020 Financial Statement	RESULTAT COURANT		
l		減価償却費	N/A	現地通貨	2020	2020 Financial Statement	N/A	不明(「Autres charges d'exploitation」その他営業費用)に含まれている可能性があるものの、内訳の記載無し)	
m		金融収益	6,110	現地通貨	2020	2020 Financial Statement	「RESULTAT FINANCIER」+「Interests」	PL項目「RESULTAT FINANCIER (IV-V)」の(V)に当たると考えられるものの、資料内(V)についての記載無し。「RESULTAT FINANCIER(ネット)」に「Interests(利払い)」を足し算して計算	
n		利払い	1,988	現地通貨	2020	2020 Financial Statement	Interests	PL項目「RESULTAT FINANCIER (IV-V)」の(V)に当たると考えられるものの、資料内(V)についての記載無し。別の表「Remboursement emprunt AWF」より記載	
o		補助金 (長期前受金戻入)	N/A	現地通貨	2020	2020 Financial Statement	N/A	情報無し	
p		純利益	-28,745	現地通貨	2020	2020 Financial Statement	RESULTAT NET		
q	CF	EBITDA	#VALUE!	現地通貨	2020	2020 Financial Statement			
r		営業CF	N/A	現地通貨	2020	2020 Financial Statement	N/A	資料:CF表無し	
s		投資CF	N/A	現地通貨	2020	2020 Financial Statement	N/A	資料:CF表無し	
t		為替	15,440,500	現地通貨/円換算レート	2024	rate202501.pdf			
経営・財務指標									
8	経営状況	会計制度	不明	—	—	一部企業会計の体系をとっているが一般的なものと異なる部分多数あり。		●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	—	—	—	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がない等を確認し、クラスタ事業戦略のナゾを検証する。 ・データの計算方法としては、①営業収益(料金収入)を有収水量で割る(日本では「供給標準」と呼称)し、②水道料金金から標準家賃において1ヶ月水道を利用した場合の料金を算出して、単位水量あたりの料金を算出する方法がある。施設BENEFITではなく使用量、使用量の少ない資産部を多量にかかると必ず使用する場合の水道料金をデータベース化しているが、より標準的な使用量として1ヶ月に20立方メートルを仮定して算出するケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するために①は②より、住民の支払い能力や支払い意思と①・②(世帯あたり)の収入がわかる場合、水道料金負担と比較する(目安は③～⑤程度)。
10		料金徴収率	%	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するか確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が高い場合、料金支払いの有無で顧客間に不公平感が生じるため、料金徴収に対する支持が得られにくくなる。
11		徴収水準	%	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を差し引いて求めた有収水量を、水道システム投入水量で割って算出する。 ・送配水管網は正確に計算されている事例は多くなく、精度の低い推定値である場合は①〇%と推定されている」と等と記述する。
12		漏水率	%	%	%	2020年の漏水量 (Linear Leakage Index, (LLI))は、18.12 m ³ /Km/day、年々減少している。	Annual Report 2020, p.28	●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送配水管網は正確に計算されている事例は多くなく、精度の低い推定値である場合は①〇%と推定されている」と等と記述する。
13		メーター設置率	%	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.28	●	・従量制を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では無効な水利用が発生し、それによって超過の不公平(浄水場や配水池に近い顧客は悪化)に水を使える一方、管網の末端まで配水されないが生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービスの改善)に繋がりが、支払い意思が向上すると考えられる。
14		売上高	1 14	百万円 百万円	百万円	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	●	・水道事業の規模感を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)を確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリターンするものには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリターンが可能な規模の目安としては、日本の水道事業体の実績をみると、給水人口10万人以上、等送配水管1kmあたりの給水人口150人以上と考えられる。
15		純利益	0 -0.443837173	百万円 百万円	百万円	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	●	・水道事業体が(特殊要因も含めて)得た総合的な収益力(規模)を把握するための指標。 ・純利益率に関する指標(自己資本当期純利益率:ROE、総資産当期純利益率:ROAなど)は収益性を把握するためのデータとしてよく利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリターンするものには一定以上の規模が必要と考えられる。
16		EBITDA	#VALUE! #VALUE!	百万円 百万円	百万円	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・水道事業体(各事業体)が(各事業体)のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式: 営業利益(Operating Profit)/各事業体(各事業体)の減価償却(もしくは Depreciation and amortisation charges) ・水道事業のように入設備投資が多く(償却費負担の大きい)場合の収益力を分析する際に用いられる。
17		EBITDAマージン	#VALUE!	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように入設備投資が多く(償却費負担の大きい)場合の収益力を分析する際に用いられる。 ・計算式: EBITDA/売上高(Sales/売上高) ・指標の目安: 30%以上が目値。世帯のUtility of the Future "World Class"の上下水道事業体の間を30%と設定。
18	収益性	総資産営業利益率 (ROA)	#VALUE!	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げており、係る成果を確認する。 ・計算式: 営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安: 5%以上が目値。
19		売上高経常利益率 (長期前受金戻入を除く)	#VALUE!	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・営業活動(水道事業)と財務活動に関する経営効率(安定的な収益性を含まない、通常の経営活動の効率)を把握するための指標。クラスタ事業戦略では、収益を上げるだけでなく(経営効率の改善を目標としており、係る成果を確認する。 ・計算式: (経常利益 - 長期前受金戻入) / (営業活動からの収入) (Government and other grants) / 売上高 (Income) ・指標の目安: 15%以上が目値。
20	安全性	自己資本比率	56%	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・資金調達面(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式: 自己資本 (Total Equity, Capital)/総資産 (Total Assets) ・指標の目安: 40%以上が目値(収益性の高い事業体の場合は30%以上)。
21		固定長期適合率	#VALUE!	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期前受金及び自己資本の範囲内の投資に注いでいる場合、長期前受金に注いでいる場合、水道事業は固定負債の割合が大きいため注意。 ・計算式: 固定資産 (Non-current Assets) / (固定負債 (Non-current Liabilities) + 自己資本 (Total Equity)) ・指標の目安: 100%以上が目値(固定負債が固定資産の一部を構成しているため)。
22		インクレストカバレッジレシオ	-30.081924	倍	倍	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・「フロー」面から見た安全性を把握するための指標。借入返済能力(利息を支払うだけの利益を確保しているか)を確認。 ・計算式: (営業利益 (Operating income)) / 金融収益 (受取利息 (Interest income)) / 配当金 (Dividend income) / 支払利息 (Interest expense) ・指標の目安: 1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。
23		EBITDA有利子負債倍率	#VALUE!	倍	倍	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式: (有利子負債 (Liability with interest)) / EBITDA ・指標の目安: 5倍以上が目値(成長ステージに依る)。
24	キャッシュフロー	フリーキャッシュフロー	#VALUE! #VALUE!	百万円 百万円	百万円	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間→成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式: 営業キャッシュフロー (Cash flows from operating activities) - 投資キャッシュフロー (Cash flows from investing activities)
25		営業キャッシュフロー・マージン	#VALUE!	%	%	・購入水量45,818,000m ³ /year ・販売水量32,833,000m ³ /year ・収益率71.66%(2020)	Annual Report 2020, p.21 https://www.radem.ma/Radem/	※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が高くなるほど、本指標の数値が低い場合、債務支払いが滞る(マイナスの場合は高水準である)可能性がある。 ・計算式: 営業CF / 売上高 (100%) ・指標の目安: 15%以上が目値(要調査)。
分析・備考欄									
(留意点)									
1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。									
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。									

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業継続「水道事業体成長支援」モニタリングシート

国名：カーボベルデ 水道事業体名：電力・水道公社 (Electra)

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け/記入上の留意点/計算式	
水道サービス指標										
1	事業規模	給水人口 (顧客数)		人	2023	契約数(active contract) 34,438件	RELATÓRIO E CONTAS 2023 p.47	●	・水道事業の規模感を把握するための指標 →一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。	
2		給水管及率		%				●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 普及率の定義(分子、分母)ごとのような数字を用いているのかや計算方法は要確認。	
3		浄水生産能力	サンティアゴ島: 20,000 サン・ヴィセンテ島: 10,000 サル島: 10,000 計37,000	m ³ /日	2023.3	水源の99.5%を海水淡水化水に依存。 生産水量実績28,414m ³ /日 (10,371,017m ³ /年)/2023	RELATÓRIO E CONTAS 2023 p.39, 40	●	・水道事業の規模感を把握するための指標。	
4		給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日(24時間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、 ①配水可能な水の絶対的に不足している、②漏水が多(24時間給水では漏水量が増加する、等が挙げられる。 ・給水地域で定まらなければならない場合、●●●時間/1日と記載した方が記載可能。	
5	サービス水準	給水水量		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準遵守等)、給水栓での残留塩素濃度を確保する(給水栓での水質基準遵守率、残留塩素検出率)。数々の把握が難しい場合は定性的な評価で代替。	
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高台や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について住民から苦情が発生していないか等)。	
7		顧客満足度		—				●	・顧客満足度を確保するための指標 ・使用者が水道サービスに対して満足しているか、何に関連して不満を抱えているかを確認する(定性的な評価)。 ・水道サービスの改善が期待できる案件ににおいては、顧客満足度調査をプロジェクトのスコアに含めることも検討する(全体的な満足度に加えて、水量・給水時間・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。	
財務データ(経営・財務指標#14-25を自動計算)										
a				単位	データ年	出典	対象項目		特記事項	
a	BS	流動資産	8,545,655	現地通貨	2023	2023 Financial Statement	Total do activo corrente			
b		現預金	31,210	現地通貨	2023	2023 Financial Statement	Caixa e depósitos bancários			
c		固定資産	11,795,325	現地通貨	2023	2023 Financial Statement	Total do activo não corrente			
d		資産合計	20,340,979	現地通貨	2023	2023 Financial Statement	Total do activo			
e		一年前の資産合計	20,149,386	現地通貨	2023	2023 Financial Statement	Total do activo			
f		固定負債	17,134,887	現地通貨	2023	2023 Financial Statement	Total do passivo não corrente			
g		有利子固定負債	17,057,877	現地通貨	2023	2023 Financial Statement	Financiamentos obtidos			
h		自己資本	-7,378,260	現地通貨	2023	2023 Financial Statement	Total do capital proprio			
i		売上高	12,963,220	現地通貨	2023	2023 Financial Statement	Vendas e Prestações de serviços			
j		営業利益	160,123	現地通貨	2023	2023 Financial Statement	Resultado operacional			
k	PL	経常利益	-225,673	現地通貨	2023	2023 Financial Statement	Resultado antes de impostos			
l		減価償却費	771,695	現地通貨	2023	2023 Financial Statement	Gastos/Reversões de depreciacao e de amortizacao			
m		金融収益	0	現地通貨	2023	2023 Financial Statement	Juros e ganhos similares obtidos			
n		利払い	385,796	現地通貨	2023	2023 Financial Statement	Juros e perdas similares suportados			
o		補助金 (長期助成金収入)	N/A	現地通貨	2023	2023 Financial Statement	N/A	PLに明記無し		
p		純利益	-231,841	現地通貨	2023	2023 Financial Statement	Resultado liquido do periodo			
q		EBITDA	931,818	現地通貨	2023	2023 Financial Statement				
r		営業CF	143,642	現地通貨	2023	2023 Financial Statement	Fluxos de caixa das actividades operacionais			
s		投資CF	-131,564	現地通貨	2023	2023 Financial Statement	Fluxos de caixa das actividades investimento			
t		為替	N/A	現地通貨/円換算レイト	2023	rate025401.pdf			カーボベルデ・エスクドの記載なし	
経営・財務指標										
8	事業規模	会計制度	・Decreto-Lei nº 5/2018 ・Código de Água e Saneamento ・Decreto-Lei nº 26/2016	—		Agência Reguladora Multissetorial da Economia (ARME) により規定	https://www.ar-me.cv/index.php?option=com_download&task=download&id=961&catid=234&m=0&Itemid=765	●	・企業会計の適用有無を確認するための項目。 →成長する水道事業体の前提条件として、企業会計を導入し、財務三表を用いて経営状況を把握・管理できている必要あり。	
9		水道料金水準	1.個人家庭(住宅) <6 m ² : 240.84, 6~10 m ² : 363.04, 10 m ² >: 489.91 2.産業・観光業 産業: 426.57, 観光: 560.74 3.社会目的 病院、公衆水道、非営利の社会団体 等: 268.67, 公共サービス、商業施設、航空、海運会社、倉庫等: 448.31 4.タンク供給 社会目的: 271.20 その他: 468.53	CVE/m ³			https://www.electra.cv/frontend/web/index.php?r=site%2Ftarifa	●	・水道料金水準が適切に設定されているかを把握するための指標。給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスタ事業継続のシナリオを把握する。 ・データ収集方法としては、①「営業収入(料金収入)÷収水枚数」で算出(自注は「残留塩素」と呼称)と、②水道料金書から「標準家庭」において1か月水道を利用した場合の料金を算出して、単位水量あたりの料金を求める方法がある。世帯BENでは、水道料金の約1/3を標準家庭において1か月1人1人使用する場合の水道料金をベースとしているが、より標準的な使用量として1か月1人20m ³ を使った場合で計算しているケースもある。 ・用途が変わり、水道事業体全体としての水道料金水準を把握するためには①がよく、住民の支払い能力や支払い意志額と比較する場合は②が有効である。 ・1世帯当たりの収入がわかる場合、水道料金負担と比較する(目安は3~5%程度)。	
10		経営状況	料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスタ事業継続のシナリオを確認する。料金徴収率が低い場合、料金支払いの無視や顧客間に不公平感が生じるため、料金改定に対する支持が得られにくくなる。
11		徴収水準	45.2	%		サンティアゴ島: 50.4% サル島: 39.5%	RELATÓRIO E CONTAS 2023 p.44	●	・水道事業の運営能力を把握するための指標。水道システム(送配水網)への投入水量から、料金請求対象水量(「収水量」)を算出して算出される収水率を、水道システム投入水量で割って算出。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「〇〇%と推定されている」と等と記述する。	
12		漏失率		%				●	・収水率の上で、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「〇〇%と推定されている」と等と記述する。	
13		メーター設置率		%				●	・無水化のリスクと、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の公平(浄水場や配水池に近い顧客は沢山に水を使える一方、管路の末端まで配水されない)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービス)の改善に繋がりが、支払い意志が向上すると考えられる。	
14	事業規模	売上高	13	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド/水道料金収入の成長、縮小、安定、不安定などにも確認する。 ・水道事業に専ら事業活動の収入であり、水道料金のみの収入(つまり「サービス」のためには一定以上の規模が必要となる。従量費を含めて水道料金でコスト/リターンが可能な環境の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、年産配水管1kmあたりの給水人口150人以上と考える。	
15		純利益	0	百万現地通貨				●	・水道事業体が「特許投資も含めて」得た総合的な収益力(損益)を把握するための指標。 ・「純利益」に関する指標(自己資本当期純利益率: ROE、総資産当期純利益率: ROAなど)は収益性を把握するデータとしてよく利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコスト/リカバーするためには一定以上の規模が必要と考えられる。	
16		EBITDA	0.931818	百万現地通貨				※	・水道事業体が生産活動のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各種減価償却費(Depreciationもしくは Depreciation and amortisation charges) ・水道事業のように設備投資が多く償却負担の大きい場合の収益力を分析する際に用いられる。	
17		EBITDAマージン	7%	%				※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように設備投資が多く償却負担の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の間値を30%と設定。	
18		収益性	総資産営業利益率(ROA)	1%	%			※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献している」と判断できる。クラスタ事業継続において、収益を確保し、収益性を高めるアプローチを模索しており、係数を確認する。 ・計算式：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：15%以上が目標。	
19		売上高経常利益率(長期助成金収入を除く)		%				※	・営業活動(水道事業)と財務活動に関する経営活動(営業的な活動)を含む、通常の経営活動の効率)を把握するための指標。クラスタ事業継続では、規模を上げるだけでなく(経営活動の改善を目指して)おり、係数を確認する。 ・計算式：経常利益(Ordinary Profit)-補助金(長期助成金収入/Government and other grants等)/売上高(Income) ・指標の目安：15%以上が目標。	
20		自己資本比率	-36%	%				※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)。	
21		安全性	固定長期適合率	121%	%			※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の負債(固定負債)は、資金繰りが注目される。水道事業は固定資産の割合が高いという特徴。 ・計算式：固定負債(Non-current Assets)/固定負債(Non-current Liabilities)+自己資本(Total Equity) ・指標の目安：100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)。	
22		インフレスタビリティ(レバレッジレシオ)	0.415045775	倍				※	・「フロー」から見た安全性を把握するための指標。返済返済能力(利息を支払う)の利益を確保しているかを把握。 ・計算式：(営業利益(Operating income)+金融収益(受取利息/Interest income)+配当金(Dividend income))/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。	
23		EBITDA有利子負債倍率	18.27252425	倍				※	・資金調達の安全性を把握するための指標。EBITDAはキャッシュ創出能力を確保するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式：有利子負債(Liability with interest)-総預金(Cash and deposits)/EBITDA ・指標の目安：5倍以上が目標(成長ステージに依存)。	
24	キャッシュフロー	フリーキャッシュフロー	0.012078	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期〜成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎる衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)	
25		営業キャッシュフローマージン	1%	%				※	・売上高に対して、営業活動を維持して現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値)が多くとも、本指標の数値が低い場合、償却支払いが滞る(マイナスの場合は償却超過)の可能性もある。 ・計算式：営業CF/売上高×100(%) ・指標の目安：15%以上が目安(要確認)。	
分析欄・備考欄				—	—	—				

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標として、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：セネガル

水道事業体名：セネガル国営水道公社 (National Water Company of Senegal (SONES))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)		人				●	・水道事業の規模感を把握するための指標。 →一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。
2		給水管及率		%				●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標。 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数字を用いているのか)や計算方法は要確認。
3		浄水生産能力		m ³ /日				●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間		時間/日				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、 ①配水可能な水量の絶対的に不足している、②漏水が多く24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域が広ければある程度、夜・朝・昼の3回、日ごとの頻度を併せた記載も可。
5		給水水量		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「浄水出口の水質が問題ないか(浄水場での水質基準値遵守)、給水枝での残留塩素濃度を確保する(給水枝での水質基準値遵守、残留塩素検出)」、双方の指標が低い場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧		—				●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・「高台や管線の老朽など、水圧が最も低くなる箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。必要時に苦情が来ているところも、その場合は定性的な評価で代替(給水圧における水圧について住民から苦情が発生していないか等)。
7		顧客満足度		—				●	・顧客満足度を確保するための指標。 ・「使用感が水道サービスに別れて満足しているか、何に別れて不満を抱えているかを確認する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する(全体的な満足度に加えて、水量(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)				単位	データ年		出典	財務項目	特記事項
a	BS	流動資産		現地通貨					
b		預当金		現地通貨					
c		固定資産		現地通貨					
d		資産合計		現地通貨					
e		一年前の資産合計		現地通貨					
f		固定負債		現地通貨					
g		有利子固定負債		現地通貨					
h		自己資本		現地通貨					
i	PL	売上高		現地通貨					
j		営業利益		現地通貨					
k		経常利益		現地通貨					
l		減価償却費		現地通貨					
m		金融収益		現地通貨					
n		利益引		現地通貨					
o		補助金 (長期前受金戻入)		現地通貨					
p		純利益		現地通貨					
q	CF	EBITDA	0	現地通貨					
r		営業CF		現地通貨					
s		投資CF		現地通貨					
t		為替		現地通貨/ 円換算レート					
経営・財務指標									
8	経営状況	会計制度		—				●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準		—				●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを検証し、クラスタ事業戦略のシナリオを検証する。 ・データの計算方法としては、①営業収益(料金収入)を有収水量で割る方法(日本では「供給単価」と呼称)と、②水道料金表から標準家庭において1か月水道を利用した場合の料金を出して、標準的な世帯の料金を求める方法がある。世帯別NETではこれを採用し、使用量の少ない貧困層を全額11か月以内で返済する場合の水道料金をデータベース化しているが、より標準的な使用量として11か月以内で返済する世帯と仮定しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためには①が、住民の支払い能力や支払い意志値と比較する場合には②が用いられる。 ・1世帯当たりの収入がわかる場合、水道料金負担と比較する(目安は3～5%程度)。
10		料金徴収率		%				●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発生した水道料金の未回収に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するか確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じたり、料金設定に対する支持が得られにくくなる。
11		徴収水準		%				●	・水道事業体の運営能力を把握するための指標。水道システム(送配水管網)への投入水費から、料金請求対象水量(有収水量)を算出して求められる徴収水準を、水道システム投入水費で割って算出。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「〇%と推定されている」と等と記述する。
12	事業規模	漏水率		%				●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、精度の低い値である場合は「〇%と推定されている」と等と記述する。
13		メーター設置率		%				●	・従量料金制を導入しているか、導入できる環境にあるかを確保するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は潔淨に水を使える一方、管線の老朽化で配水できない状況)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービス)の改善に繋がり、支払い負担が向上すると考えられる。
14		売上高	0	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド/水道料金収入の成長、縮小、安定、不安定なども確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストカバーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、有収配水人口あたりの給水人口150人以上と考える。
15		純利益	0	百万現地通貨				●	・水道事業体が(特殊要因も含めて)持続的な収益力(規模)を把握するための指標。 ・純利益率に関する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要と考えられる。
16	収益性	EBITDA	0	百万現地通貨				※	・水道事業体などの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各種減価償却費(Depreciationもしくは Depreciation and amortisation charges) ・水道事業のよう設備投資が多(償却費用負担の大きい場合)の収益力を分析する際に用いられる。
17		EBITDAマージン	#DIV/0!	%				※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように設備投資が多(償却費用負担の大きい場合)の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の間を30%と設定。
18		総資産営業利益率(ROA)	#DIV/0!	%				※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げたり、係数成果を確保する。 ・計算式：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：15%以上が目標。
19		売上高経常利益率(長期前受金戻入を除く)	#DIV/0!	%				※	・営業活動(水道事業)と財務活動に関する経営効率(実効的な利益率)を、通常の経営活動の効率を把握するための指標。クラスタ事業戦略では、規模を上げただけでなく経営効率の改善を目指しており、係数成果を確保する。 ・計算式：(経常利益(Ordinary Profit)-補助金(長期前受金戻入)(Government and other grants等))/売上高(Income) ・指標の目安：15%以上が目標。
20	安全性	自己資本比率	#DIV/0!	%				※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)
21		固定長期適合率	#DIV/0!	%				※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の投資にない限り、資金調達が容易である。水道事業は固定負債の割合が大きいため注意。 ・計算式：固定資産(Non-current Assets)/固定負債(Non-current Liabilities)+自己資本(Total Equity) ・指標の目安：100%を上回る場合は注意(固定資産の一部を流動負債で賄っている状態)
22		インタレストカバレッジレシオ	#DIV/0!	倍				※	・フローベースに見た返済能力を把握するための指標。債務返済能力(利息を支払うだけの利益を確保しているか)を確認。 ・計算式：(営業利益(Operating income) + 金融収益(受取利息)(Interest income) + 配当金(Dividend income) + 支払利息(Interest expense)) / 借入金元金返済額(返済元金) ・指標の目安：1.0倍を下回る場合は注意(金融費用が事業利益を上回っている状態)
23		EBITDA有利子負債倍率	#DIV/0!	倍				※	・資金繰りの観点からの安全性を把握するための指標。EBITDAはキャッシュ創出力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式：(有利子負債(Liability with interest)-預当金(Cash and deposits))/ EBITDA ・指標の目安：5年以上が目標(成長ステージに依る)
24	キャッシュフロー	フリーキャッシュフロー	0	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities) - 投資キャッシュフロー(Cash flows from investing activities)
25		営業キャッシュフローマージン	#DIV/0!	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が大きいほど、本指標の数値が高い場合、償却支払いが滞る(マイナスの場合は赤字状態)可能性がある。 ・計算式：営業CF/売上高×100 [%] ・指標の目安：15%以上が目安(要補償)
分析欄・備考欄				—	—		—		

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

国名:ボツワナ 水道事業体名:Water Utilities Corporation (WUC)

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	位置付け/記入上の留意点/計算式
水道サービス指標									
1	事業規模	給水人口(顧客数)	550,000	人	2023	p.7 Summary of Performance	WUC Annual Report 2023-2024	●	・水道事業の規模感を把握するための指標。 ・一般に水道事業体を把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。
2		給水管及率	都市部: 98% 農村部: 83%	%	2023	p.12 Sustainability and Social Impact	WUC Annual Report 2023-2024	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標。 ・計算式: 給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数字を用いているのか)や計算方法は要確認。
3		浄水生産能力	580,000	m ³ /日	2023	p.40 Palapye Water Treatment Plant Expansion ※計画能力	WUC Annual Report 2023-2024	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	都市部: 23.6 農村部: 20.1	時間/日	2023	p.11 Corporate Strategy	WUC Annual Report 2023-2024	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多いため時間給水では漏水量が増加する、等が挙げられる。 ・給水区域や地域によって異なる場合、●●

(留意点)

- 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
- ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標として、データの収集を目指す。

Appendix 4 Monitoring Sheet

Appendix 4.2 Category B (7 utilities)

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名: サモア国 水道事業体名: サモア水道公社 (Samoa Water Authority(SWA))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け/記入上の留意点/計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	190, 195 (27,790)	人 (人数)	2023		質問回答	●	・水道事業の規模感を把握するための指標 一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水戸数(接続数)であるため、給水戸数(接続数)を記載してもよい。
2		給水管及率	90	%	2023		質問回答	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 計算式: 給水人口/給水対象エリアの人口 普及率の定義(分子、分母)により異なる数字を用いているのかや計算方法は要確認。
3		浄水生産能力	—	m ³ /日	2023	給水量は74.278m ³ /d	質問回答	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	24	時間/日	2023		質問回答	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 連続給水ではなく時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多量に発生し24時間給水では漏水量が増加する、等が挙げられる。 給水確保がとらざるある場合、備へる設備/日など欄を併記して記載可。
5		給水水量	100	%	2023	全てのサンプル(248検体)は水道水質ガイドライン/値/基準値を満たす。	質問回答	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 浄水出口の水質が問題ないか(浄水場での水質基準厳守)、給水での残留性塩素濃度を把握する(給水での水質基準厳守率、残留性塩素検出率)、給水の把握が難しい場合は定性的な評価で代替。 定性的な評価として、使用者から苦情が発生していないかも等も確認する。
6		給水圧	5	m	2023	低給水圧地域は無し。	質問回答 2021.2022年次報告書	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 高圧や管網の末端など、水圧が最も低くなる箇所でもモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(漏水における水圧について住民から苦情が発生していないか等)。
7		顧客満足度	—	—	2023	有効データ無し。	質問回答	●	・顧客満足度を把握するための指標 使用率が水道サービスに対して満足しているか、何に関して不満を抱えているかを把握する(定性的な評価)。 水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコープに含めることも検討する(全体の満足度に加えて、水量・給水時間・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)
財務データ(経営・財務指標#14-25を自動計算)									
a	BS	流動資産	35,128,231	現地通貨	2022	2022 Financial Statement	Total current assets		
b		預現金	24,482,508	現地通貨	2022	2022 Financial Statement	Cash and cash equivalents		
c		固定資産	176,223,576	現地通貨	2022	2022 Financial Statement	Non current assets		
d		資産合計	211,351,807	現地通貨	2022	2022 Financial Statement	TOTAL ASSETS		
e		一年前の資産合計	205,661,701	現地通貨	2021	2022 Financial Statement	TOTAL ASSETS		
f		固定負債	142,413,234	現地通貨	2022	2022 Financial Statement	Non current liabilities		
g		有利子固定負債	0	現地通貨	2022	2022 Financial Statement	Lease liabilities		
h		自己資本	207,736,686	現地通貨	2022	2022 Financial Statement	「TOTAL EQUITY AND LIABILITIES」-「Total	自己資本について、BS上の数値から算出	
i		売上高	29,297,861	現地通貨	2022	2022 Financial Statement	Total income		
j		営業利益	-614,792	現地通貨	2022	2022 Financial Statement	「Total income」-「Total expenses」	営業利益について、PL上の数値から算出	
k	PL	経常利益	-1,133,435	現地通貨	2022	2022 Financial Statement	Net (loss)/profit		特別損益、税金費用の記載が財務諸表にないため、「Net (loss)/profit」=経常利益の認識で記載
l		減価償却費	5,977,752	現地通貨	2022	2022 Financial Statement	「Depreciation」+「Amortisation of lease	Depreciation&Amortisation of lease assetsの合計	
m		金融収益	0	現地通貨	2022	2022 Financial Statement	Net finance costs		
n		利払い	0	現地通貨	2022	2022 Financial Statement	Net finance costs		
o	CF	補助金 (長期前受金投入)	6,920,474	現地通貨	2022	2022 Financial Statement	「Grants」+「Amortisation」	Grants&Amortisationの合計	
p		純利益	-1,133,435	現地通貨	2022	2022 Financial Statement	Net (loss)/profit		
q	CF	EBITDA	5,382,960	現地通貨	2022	2022 Financial Statement			
r		営業CF	-972,908	現地通貨	2022	2022 Financial Statement	Net cash flows from operating activities		
s		投資CF	-5,771,602	現地通貨	2022	2022 Financial Statement	Net cash flows for investing activities		
t		為替	56	現地通貨/ 円換算レート	2024	rate202501.pdf			
経営・財務指標									
8	事業規模	会計制度	企業会計	—				●	・企業会計の適用有無を確認するための項目。 成長する水道事業体の前提条件として、企業会計を適用し、財務表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	1~15m ³ : \$0.61/m ³ 15~40m ³ : \$1.34/m ³ 40m ³ ~ : \$1.74/m ³ 定額: \$16	—	2023(?)	https://samowatwa.authority.ws/our-services/your-meter-account/?v=54df3baef130		●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスタ事業戦略のシナリオを確認する。 データの計算方法としては、①「営業収益(料金収入)÷有収水量で算出する方法(日本では「供給単価」と呼称)と、②「水道料金表から有収水量(および有収水量を利用し、有収量の料金表を算出)し、単位水量あたりの料金と算出する方法がある。後者のNETでは左を適用し、使用量の少ない賃貸用を考慮し(1ヵ月6m ³ を使用する場合の水道料金をデータベース化しているが、より標準的な使用量として1ヵ月20m ³ を仮定した場合でも適用しているケースもある。 用途を問わず、水道事業体を対象としての水道料金水準を把握する際には)がよく、住民の支払い能力や支払い意思と比較する場合にはこれが用いられる。 1世帯あたりの収入がわかる場合、水道料金負担と比較する(目安は3~5%程度)。
10		料金徴収率	78.73	%	2023	収入総額/全請求書総額	質問回答	●	・水道事業体の料金回収能力を確認するための指標。 ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスタ事業戦略のシナリオを確認する。料金徴収率も低い場合、料金支払いの遅延や滞りによる苦情が懸念されるため、料金徴収に対する苦情の発生に注意。
11	経営状況	無収水準	41	%	2023	有収水量/給水量	質問回答	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を差し引いて求められる無収水量を、水道システム投入水量で割って算出。 値上りでは正確に計算されている事例は多くなく、精度の低い推定値であるその場合は「〇%と推定されている」と等と記述する。
12		漏水率	—	%	2023	1169件/年(給水管破損件数)	質問回答	●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 値上りでは正確に計算されている事例は多くなく、精度の低い推定値であるその場合は「〇%と推定されている」と等と記述する。
13	事業規模	メーター設置率	99.24	%	2023	メータ設置件数/全接続件数	質問回答	●	・従量制を導入しているが、導入できる環境にあるかを把握するための指標。 初期導入で無償な水利用が発生し、それらに起因して配水の不公平(浄水場や配水池に近い顧客は水を確保し一方、管網の末端まで配水されない)が生じる。簡易メーターを設置し従量制に移行することで、配水(サービス)の改善に繋がり、支払い意思が向上すると考えられる。
14		売上高	29 1,636	百万現地通貨 百万円				●	・水道事業体の規模を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 水道事業体は資本集約的な産業であり、水道料金のほかコスト(リバー)するものには一定上の規模が必要である。施設費用を含めて水道料金でコスト(リバー)が可能な規模の目安としては、日本の水道事業体の実績を踏まえる、給水人口10万人以上、年送配水1kmあたり給水人口150人以上と考えられる。
15	事業規模	純利益	-1 -63.27514231	百万現地通貨 百万円				●	・水道事業体が(特殊要因も含めて)得た総合的な収益力(規模)を把握するための指標。 純利益率に関する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 水道事業は資本集約的な産業であり、水道料金のみでコスト(リバー)するためには一定上の規模が必要と考えられる。
16		EBITDA	5,382,960 299,392,605	百万現地通貨 百万円				※	・水道事業体ごとの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 計算式: 営業利益(Operating Profit)+各種償却費(Depreciation もしくは Depreciation and amortisation charges) 水道事業のよりに設備投資が多(償却費用)の大きい場合の収益力を分析する際に用いられる。
17	収益性	EBITDAマージン	18%	%				※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のよりに設備投資が多(償却費用)の大きい場合の収益力を分析する際に用いられる。 計算式: EBITDA/売上(SalesまたはIncome) 指標の目安: 30%以上が目値。世銀のUtility of the FutureではWorld Classの上下水道事業体の間値を30%と設定。
18		総資産営業利益率(ROA)	0%	%				※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を維持し収益性を高めるアプローチを掲げており、係る成果を把握する。 計算式: 営業利益(Operating Profit)/総資産(Total Assets) 指標の目安: 5%以上が目値。
19		売上高経常利益率(長期前受金投入を除く)	-27%	%				※	・「営業活動(水道事業)と財務活動」に関する経営活動(安定的な収益性を含み、通常の経営活動の効率)を把握するための指標。クラスタ事業戦略では、規模を上げただけで経営効率の改善を目指しており、係る成果を把握する。 計算式: (経常利益(Ordinary Profit)-補助金(長期前受金投入))(Government and other grants等)/売上高(Income) 指標の目安: 15%以上が目値。
20		自己資本比率	98%	%				※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 計算式: 自己資本(Total Equity, Capital)/総資産(Total Assets) 指標の目安: 40%以上が目値(収益性の高い事業体の場合は30%以上)。
21	安全性	固定長期適合率	50%	%				※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期前受金及び自己資本の範囲内の投資になっていない場合、資金繰りが圧迫される。水道事業は固定資産の割合が大きいため重要。 計算式: 固定資産(Non-current Assets)/固定負債(Non-current Liabilities)+自己資本(Total Equity) 指標の目安: 100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)。
22		インゲレスとカパベジレンジ	#DIV/0!	倍				※	・「フロー」面から見た安全性を把握するための指標。償却返済能力(利息を支払うだけの利益を確保しているか)を確認。 計算式: (営業利益(Operating income)+金融収益(受取利息 Interest income)+配当金(Dividend income))/支払利息(Interest expense) 指標の目安: 1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。
23	キャッシュフロー	EBITDA有利子負債倍率	-4.565111058	倍 現地通貨				※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味する一方、有利子負債の返済に要する利息を意味する。返済に要する利息がEBITDAを上回る場合は要注意。 計算式: (有利子負債(Liability with interest)-増損金(Cash and deposits))/EBITDA 指標の目安: 3倍以下が目値(成長ステージに依る)。
24		フリーキャッシュフロー	-6.74451 -376.5190153	百万現地通貨 百万円				※	・水道事業体の成長ステージを把握するための指標。メンテナンスの場合は長期増収・成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎる衰退期にあると考えられる。 計算式: 営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)
25	分析面・備考欄	営業キャッシュフローマージン	-3%	%				※	・売上高に対して、営業活動を通じた現金収入の割合を把握することで、経営状況を判断するための指標。営業利益(PL)の数値が大きい。本指標の数値が悪い場合、償却支払いが滞る(マイナスの場合は黒字倒産)の可能性もある。 計算式: 営業CF/売上高×100(%) 指標の目安: 15%以上が目値(要確認)。
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(留意点)
1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスター事業戦略「水道事業体成長支援」モニタリングシート

国名：バングラデシュ

水道事業体名:ダッカ上下水道局(Dhaka Water Supply and Sewerage Authority (DWASA))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	メモがらに必要	位置付け／記入上の留意点／計算式	
水道サービス指標										
1	事業規模	総人口(顧客数)	22,000,000	人	2022	接続数387366箇所	質問票回答	●	・水道事業の規模感を把握するための指標。 一般に水道事業体が把握しているのかを把握するための指標。	
2		給水管長さ	100	%	2022		質問票回答	●	・水道事業者の対象エリアの水需要を満たせているかを把握するための指標 ・計算法：総人口×給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数字を用いているか)や計算方法は要確認。	
3		浄水生産能力	2,680,000	m ³ /日	2022		質問票回答	●	・水道事業の規模感を把握するための指標。	
4	サービス水準	給水時間	24	時間/日	2022		質問票回答	●	・水道事業者の運転維持管理能力を把握。水道サービス水準・顧客満足度を把握するための指標。 ・連続給水でない(断続給水の昼、日(または夜間)ありの給水時間を記載)。一般に、時間給水を採用する理由としては、 ①取水可能な水量の制約にない(水源地での取捨選択等)、給水口の設備整備進度を確認する(給水口での水量基準順守、故障発生後速処)、数字の把握が難しい場合は定性的な評価で代替。 ・給水区域中でばつぎがある場合、●→●時間/日などを付した記載も可。	
5		給水水質	91.5	—	2022		質問票回答	●	・水道事業者の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水処理出口の水質が問題ない(水源地での取捨選択等)、給水口の設備整備進度を確認する(給水口での水量基準順守、故障発生後速処)。数字の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないかも確認する。	
6		給水圧	1bar	—	2022		質問票回答	●	・水道事業者の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高圧や断続的なおきなど、水圧が最も大きな指標をモニタリングしながら運用し、測定結果がわかるかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水網における水圧についての住民からの苦情が発生していないか等)。	
7		顧客満足度	High	—	2022		質問票回答	●	・顧客満足度を確保するための指標。 ・使用者が水道サービスに対して満足しているか、例に関して不満を抱えているかを確認する(「定性的な評価」)。 ・水道サービスの改善が期待できる事例においては、顧客満足度調査をプロジェクトのスクープに含めることも検討する(全体的な満足度に加えて、水質(給水水質)・水圧・水圧：水道事業者の顧客対応・水道料金等、項目ごとの満足度を調査)。	
財務データ(経営・財務指標#14-25を自動計算)										
				単位	データ年	出典	財政項目		特記事項	
a	BS	流動資産	29,181,054,125	現地通貨	2023	2023 Financial Statement	Total Current Assets			
b		現金預金	8,684,846,277	現地通貨	2023	2023 Financial Statement	Cash and cash equivalents			
c		固定資産	304,319,841,222	現地通貨	2023	2023 Financial Statement	Total Non-Current Assets			
d		資産合計	333,500,895,347	現地通貨	2023	2023 Financial Statement	Total Assets			
e		一年前の資産合計	234,340,111,263	現地通貨	2022	2023 Financial Statement	Total Assets			
f		固定負債	231,069,600,868	現地通貨	2023	2023 Financial Statement	Total Non-current Liabilities			
g		有利子固定負債	143,020,280,547	現地通貨	2023	2023 Financial Statement	Loans and borrowings			
h		自己資本	92,016,273,788	現地通貨	2023	2023 Financial Statement	Total capital and equity			
i		売上高	20,508,816,289	現地通貨	2023	2023 Financial Statement	Total Operating income (A)	Service delivery earnings (Revenue)とございましたが、Other business income含むTotal Operating income (A)を転記しています。		
j		営業利益	6,475,663,681	現地通貨	2023	2023 Financial Statement	Operating profit (A-B)			
k	PL	経常利益	-3,354,598,539	現地通貨	2023	2023 Financial Statement	Profit/(Loss) before tax			
l		減価償却費	3,130,366,564	現地通貨	2023	2023 Financial Statement	[Depreciation]+[Amortization]			
m		金融収益	593,767,384	現地通貨	2023	2023 Financial Statement	*Interest (on STD a/c and FDI investment)+*Interest	Interest (on STD a/c and FDI investment)とinterest on loan to employee の二つの記載があったため、足し合わせて記載しました。		
n		利払い	1,403,326,470	現地通貨	2023	2023 Financial Statement	Interest expense			
o		補助金(長期助成金収入)	3,847,290,008	現地通貨	2023	2023 Financial Statement	*Government grants for drainage maintenance+*	Government grants for drainage maintenanceとDeferred income for current year depreciation の二つの記載があったため、足し合わせて記載しました。		
p		純利益	-5,258,668,815	現地通貨	2023	2023 Financial Statement	Profit/(Loss) after tax			
q		EBITDA	9,606,030,245	現地通貨	2023	2023 Financial Statement				
r		CF	営業CF	1,615,673,600	現地通貨	2023	2023 Financial Statement	A. Net cash flow from Operating activities		
s		投資CF	-29,878,022,694	現地通貨	2023	2023 Financial Statement	B. Net cash flows from Investing activities			
t		為替	1.283060	現地通貨/円換算レート	2024	rate202501.pdf				
経営・財務指標										
8	事業規模	会計制度	企業会計	—	—			●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業者の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。	
9		水道料金水準	—	—	—	DWSAは年率5%までの値上げが認められている。現在、インフレーション率5%を超えており、料率水準も5%以上引きあげられている。 これらの影響幅は20%から30%であり、ハンガリー政府の地方政府部門の承認を得て、一般的な経済状況や相場の財政政策に基づいて行われている。	質問票回答	●	・水道料金を適切に設定されているかを把握するための指標。給水時間、給水圧、給水水質等の改善に伴い料金値上げを行った場合、料金徴収に影響がないかを掌握し、クラスター事業戦略のシナリオを確認する。 ・データの計算方法としては、①営業収益(損益表)に有効水量で割る方法(日本では「価格単価」と呼称)と、②水道料金表から顧客家数において平均水道を利用した場合の料金を算出して、単価÷水量あたりの料金を求める方法がある。両者BINEGでは②を採用し、使用水量の少ない利用層を考慮し(1ヵ月1c㎡を使用する場合の水道料金をデーターベースとしているが、より標準的な用途として1ヵ月1c㎡を想定した価格で計算している)ケースである。 ・用途を問わず、水道事業全体にとって水道料金水準を客観的に評価するには①より、住民の支払い能力や支払意欲額と比較する場合には②が用いられる。 ・①顧客当たりの収入がわかる場合、水道料金負担と比較する(目安は3～5%程度)。	
10		経営状況	料金徴収率	99.98	%	2022		質問票回答	●	・水道事業者の料金回収能力を把握するための指標。 ・ある期間に発行した水道金の請求書の割合について、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水質等の改善に伴う移行によって向上する可能性、クラスター事業戦略のシナリオを確認する。料金徴収率が低い場合、料率支払いの有無・無断停電による公平感が低下し、料金徴収に対する支持が得られにくくなる。
11		無収水準	18	%	2022	DMAでは10%程度、DMA以外では18%以下。		質問票回答	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への収入水量から、料金請求対象水量(有効水量)を差し引いて求められた無収水量を、水道システム投入水量で割って計算。 ・売上高には正確に計算されるとは考えられない。精度の高い程度である場合は〇〇％と判定されている等と記述する。
12		漏水率	—	%	—	パイプ破壊 365箇所/年(2023)		質問票回答	●	・無収水のうち、どの程度の物理的損失であるかを把握し、水道事業者の運転維持管理能力を把握するための指標。 ・送水側では正確に計算される事例は多くなく、精度の低い程度である場合は〇〇％と判定されている等と記述する。
13		メータ設置率	98	%	2022			質問票回答	●	・従来メータ導入しているか、導入できない理由
14		事業規模	売上高	20,509	百万現地通貨	2023			●	・水道事業者の規模感を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリカバーが可能な規模の目安としては、日本の水道事業者の実績をみると、給水人口10万人以上、送配水管1kmあたりの給水人口150人以上と考えられる。
15			純利益	-5,259	百万現地通貨	2023			●	・水道事業者が(特種収益も含めて)得た総合的な収益力(規模)を把握するための指標。 ・純利益率に関する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業者は資本集約的な産業であり、水道料金のみでコストリカバーするためには一定以上の規模が必要と考えられる。
16			EBITDA	9606.030245	百万現地通貨	2023			※	・水道事業者がどの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算法：営業利益(Operating Profit)-減価償却費(Depreciation もしくは Depreciation and amortisation charges) ・水道事業のように施設投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。
17		収益性	EBITDAマージン	4.7%	%	2023			※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように施設投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。 ・計算法：EBITDA/売上(Gross Sales)=Income ・指標の目安：30%以上が目標。世銀のUtility of the FutureではWorld Classの上下水道事業者の割合を30%と判断。
18	総資産営業利益率(ROA)		2%	%	2023			※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスター事業戦略においては、生産規模を増やし収益性を高めるアプローチを掛けあがり、成果を果実を確認する。 ・計算法：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：5%以上が目標。	
19	売上高経常利益率(長期助成金収入を除く)		-30%	%	2023			※	・営業活動(水道事業)と財務活動に関する経営比率(安定的な価値を生まない、通常の経営活動の効率)を把握するための指標。クラスター事業戦略においては、規模を上昇させるだけでなく経営効率の改善も目指すことが、成果を果実を確認する。 ・計算法：経常利益(Neet Current Assets)-補助金(長期助成金収入)+Government and other grants等/売上高(Revenue) ・指標の目安：15%以上が目標。	
20	安全性	自己資本比率	28%	%	2023			※	・資金調達率(BSの右側)での資金性を把握するための指標。借換率が高いほど経営が安定している。 ・計算法：自己資本(Total Equity)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)	
21		固定長期適合率	94%	%	2023			※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の投資にない場合、資金繰りが悪化される。水道事業は固定資産の割合が高いため注意。 ・計算法：固定資産(Neet Current Assets)/固定負債(Total Liabilities)-自己資本(Total Equity) ・指標の目安：100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)	
22		インタレストカバレッジ	5.037623971	倍	2023			※	・プロプライエタリな安全性を把握するための指標。債務返済能力(利息を支払うだけの利益を獲得しているか)を確認。 ・計算法：営業利益(Operating income)-金融収益(受取利息 Interest income)/配当金(Dividend income)/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要注意(金融負債が営業利益を上回っている状態)	
23	キャッシュフロー	EBITDA有利子負債倍率	13.98449004	倍	2023			※	・資金繰りの観点からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する年利倍率とすると解釈される。 ・計算法：(有利子負債(Liability with interest)-現金預金(Cash and deposits))/EBITDA ・指標の目安：5倍以上が目標(成長ステージに依る)	
24		フリーキャッシュフロー	-28262.34909	百万現地通貨	2023			※	・水道事業者の成長ステージを把握するための指標。マイナスの場合は短期間→成長期、プラスの場合は成熟期にあり、FCFが水源地から伸びている場合、成熟期を過ぎて成熟期にあると考えられる。 ・計算法：営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)	
25		営業キャッシュフローマージン	0.078779466	%	2023			※	・売上高に対して、営業活動を通じた現金収入の割合を把握することで、経営状況と判断するための指標。営業利益率(PLの数値)と異なり、本邦の財務慣行に近く、債務負担が大きいマイナスの場合は赤字状態とする可能性がある。 ・計算法：営業CF/売上高×100(%) ・指標の目安：15%以上が目安(要確認)	
分析欄・備考欄					—	—	—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

No. 評価項目 モニタリング指標 データ 単位 データ取得年 備考 出典 モニタリングに必要 位置付け／記入上の留意点／計算式									
水道サービス指標									
1	事業規模	給水人口 (顧客数)	564,000	人	2023	接続数51124	質問票回答	●	・水道事業の規模感を把握するための指標 一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水栓数(接続数)であるため、給水栓数(接続数)を記載してもよい。
2		給水管及率	87.6	%	2023		質問票回答	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 「計算式：給水人口/給水対象エリアの人口 普及率の定義(分子、分母にどのような数字を用いているのか)や計算方法は要確認。
3		浄水生産能力	107,040	m ³ /日	2023		質問票回答	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	12	時間/日	2023		質問票回答	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 「連続給水ではなく断続給水の場合、1日(または1週間)あたりの給水時間に記載。一般に、断続給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多(24時間給水では漏水量が増加する、等)が挙げられる。 給水区域中でばらつきがある場合、●→●時間/日などを補てんさせた記載可。
5		給水水量	80.52	—	2023	水質基準適合サンプル数/全サンプル数	質問票回答	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 「浄水場出口の水が問題ない(汚水場での水質基準適合率)、給水栓での残留塩素濃度を確保する(給水栓での水質基準適合率、残留塩素検出率)、数字の把握が難しい場合は定性的な評価で代替。 「定性的な評価として、使用客からの苦情が発生していないかも確認する。
6		給水圧	2bar	—	2023		質問票回答	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 「高台や管網の末端など、圧力が最も低くなる箇所をモニタリング地点として選択し、適正な圧力があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について住民から苦情が発生していない等)。
7		顧客満足度	-	—	—	質問状に記載無し			・顧客満足度を確保するための指標 「使用客が水道サービスに対して満足しているか、何に関して不満を抱えているかを把握する(定性的な評価)。 水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコープに含めるとも検討する(全体の満足度)に照らして、水質・給水時間・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)									
単位 データ年 出典 財務項目 特記事項									
a	BS	流動資産	697,658,478	現地通貨	2022	2022 Financial Statement	Current Asset		
b		現金預金	150,303,347	現地通貨	2022	2022 Financial Statement	Cash and Cash Equivalents		
c		固定資産	1,015,472,424	現地通貨	2022	2022 Financial Statement	Total non-current asset		
d		資産合計	1,717,539,849	現地通貨	2022	2022 Financial Statement	Total Asset		
e		一年前の資産合計	1,283,502,448	現地通貨	2022	2022 Financial Statement	Total Asset		
f		固定負債	0	現地通貨	2022	2022 Financial Statement	Non-current Liabilities		
g		有利子固定負債	0	現地通貨	2022	2022 Financial Statement			
h		自己資本	1,681,782,317	現地通貨	2022	2022 Financial Statement	EQUITY AND LIABILITIES Fund Accounts		
i	PL	売上高	669,901,173	現地通貨	2022	2022 Financial Statement	Total Income (A)		
j		営業利益	350,623,619	現地通貨	2022	2022 Financial Statement	Operating Profit (A-B)		
k		経常利益	350,623,619	現地通貨	2022	2022 Financial Statement	Profit before tax		
l		減価償却費	40,920,254	現地通貨	2022	2022 Financial Statement	Depreciation		
m		金融収益	23,756,015	現地通貨	2022	2022 Financial Statement	Interest Income		
n		利払い	0	現地通貨	2022	2022 Financial Statement	Interest Expenses		
o		補助金 (長期前受金控入)	581,519,459	現地通貨	2022	2022 Financial Statement	Donation Received from Government		
p		純利益	350,623,619	現地通貨	2022	2022 Financial Statement	Profit after tax		
q	CF	EBITDA	391,543,873	現地通貨	2022				
r		営業CF	402,040,682	現地通貨	2022	2022 Financial Statement	A Net cash used from Operating Activities		
s		投資CF	-345,838,941	現地通貨	2022	2022 Financial Statement	B Net cash used in Investing Activities		
t		為替	1.283060	現地通貨/円換算レート	2024	rate202501.pdf			元資料での通貨単位はTakaですが、検索したところコードがBDTとのことなので、パングラデシュの為替を記入しています。
経営・財務指標									
8	経営状況	会計制度	企業会計	—	—			●	・企業会計の適用有無を確認するための項目。 成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	—	—	—			●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを等確認し、クラスター事業戦略のシナリオを検討する。 一つの計算方法としては、①(営業利益(料金収入)-有収水量で割る方法(日本では「供給単価」と呼称))と、②水道料金表から「標準家庭」について1ヶ月の水使用量(料金表を参照して、単位消費量とのかを参考する方法がある。世帯別ETでは2を適用)、水使用量の少ない世帯(例として1ヶ月に5m ³ を使用する場合の水水道料金をデータベースとしているが、より簡便な使用量として1ヶ月に3m ³ を定めた場合)で計算しているケースもある。 用途を問わず、水道事業体全体としての水道料金水準を把握するためには①がよく、住民の支払い能力や支払い意志額と比較する場合には②が用いられる。 世帯当たりの収入がある場合、水道料金負担と比較する(目安は①-9程度)。
10		料金徴収率	67	%	—		質問票回答	●	・水道事業体の料金徴収能力を確認するための指標。 ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスター事業戦略のシナリオを検討する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じたため、料金決定に対する支持が得られにくくなる。
11		徴収水準	29.47	%	—		質問票回答	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を差し引いて求められる徴収水量を、水道システム投入水量で割って算出。 水道上では正確に計算されている事例は多くなく、精度の低い値で推定する場合は〇%と推定されている等と記述する。
12	事業規模	漏水率	—	%	—			●	・漏水率のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 地上部では正確に計算されている事例は多くなく、精度の低い値で推定する場合は〇%と推定されている等と記述する。
13		メーター設置率	—	%	—			●	・従量料金を導入しているか、導入できる環境にあるかを把握するための指標。 定額では無意味な水利用の発生し、それに起因して配水の不公平(汚水場や配水池に近い顧客は実際に水を使える一方、管網の末端まで配水されない)が生じる。顧客メーターを設置し従量制に移行することで、配水(水道サービス)の改善が図り、支払い意志が向上すると考えられる。
14		売上高	670	百万現地通貨	—			●	・水道事業体の規模感を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストカバーが可能かどうかの目安としては、ある年水道事業体の実績を把握すると、給水人口10万人以上、導水配水管1kmあたりの給水人口150人以上と考えられる。
15		純利益	351	百万現地通貨	—			●	・水道事業体が「特殊要因も含めて」持った総合的な収益力(規模)を把握するための指標。 純利益率に関する指標(自己資本当期純利益率: ROE、総資産当期純利益率: ROAなど)は収益性を把握するデータとして良利用される。 水道事業は資本集約的な産業であり、水道料金のみでコストカバーするためには一定以上の規模が必要と考えられる。
16	収益性	EBITDA	391,543,873	百万現地通貨	—			※	・水道事業体ごとの程度のキャッシュフローを割出する能力(規模)があるかを把握するための指標。 計算式：営業利益(Operating Profit)-減価償却費(Depreciation) & 減価償却(Depreciation and amortization charges) 水道事業体のように設備投資が多く償却負担の大きい場合の収益力を分析する際に用いられる。
17		EBITDAマージン	58%	%	—			※	・活用可能なキャッシュフロー割出力を把握するための指標。水道事業のように設備投資が多く償却負担の大きい場合の収益力を分析する際に用いられる。 計算式：EBITDA/売上高(SalesまたはIncome) 指標の目安：5%以上が目標。指標のAbility of the Future ではWorld Class以上で水道事業体の関係を30%と判断できる。
18		総資産営業利益率 (ROA)	23%	%	—			※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献しているかと判断できる。クラスター事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げたり、係る成果を確認する。 計算式：営業利益(Operating Profit)/ 総資産 (Total Assets) 指標の目安：5%以上が目標。
19		売上高経常利益率 (長期前受金控入を除く)	-34%	%	—			※	・「営業活動(水道事業)と財務活動」に関する経営効率(実効的な機会を含まない、通常の経営活動の効率)を把握するための指標。クラスター事業戦略では、規模を上げるだけでなく(経営効率の改善を目指す)おり、係る成果を確認する。 計算式：(経常利益 (Ordinary Profit)-補助金(長期前受金控入)(Government and other grants等))/売上高 (Income) 指標の目安：1%以上が目標。
20	安全性	自己資本比率	98%	%	—			※	・資金調達面(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 計算式：自己資本 (Total Equity, Capital)/総資産 (Total Assets) 指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)。
21		固定長期適合率	60%	%	—			※	・資本構成上の安全性(固定資産を固定負債・自己資本で覆っているか)を確認する指標。長期借入金及び自己資本の範囲内の投資に乏しい場合、資金繰りに注意される。水道事業は固定資産の割合が大きい産業である。 計算式：固定資産 (Non-current Assets)/ (固定負債 (Non-current Liabilities)+ 自己資本 (Total Equity)) 指標の目安：100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)。
22		インタレストカバレッジ	0	倍	—	支払い金利無し		※	・フロー面からの安全性を把握するための指標。償還返済能力(利息を支払うだけの利益を獲得しているか)を確認。 計算式：(営業利益 (Operating income)-金融収益(貸取利息 (Interest income)+ 配当金 (Dividend income))/支払利息 (Interest expense) 指標の目安：1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)。
23		EBITDA有利子負債倍率	-0.383873577	倍	—			※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ割出力能力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 計算式：(有利子負債 (Liability with interest)-現預金 (Cash and deposits))/ EBITDA 指標の目安：1.0倍を下回る場合は要注意(返済能力が不足している状態)。
24	キャッシュフロー	フリーキャッシュフロー	56,201,721	百万現地通貨	—			※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎた衰退期にあると考えられる。 計算式：営業キャッシュフロー (Cash flows from operating activities)-投資キャッシュフロー (Cash flows from investing activities)
25		営業キャッシュフローマージン	0.600149213	%	—			※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が大きいとも、本指標の数値が高い場合、債務支払いが滞る(マイナスの場合は黒字倒産する)可能性がある。 計算式：営業CF/売上高×100 指標の目安：1%以上が目標(業績)。
分析用・備考欄									

(留意点)

- 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
- ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標として、データの収集を目指す。

国名：パングラデシュ

水道事業体名：クルナ上下水道局 (Kulna Water Supply and Sewerage Authority (KWASA))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	1,100,000	人	2024	接続数42,000	質問票回答の該当項目参照（以下、同様） 1.2 Basic Indicators 2. Population served by water supply services	●	・水道事業の規模感を把握するための指標 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水人数（接続数）であるため、給水人数（接続数）を記載してもよい。
2		給水管及事	78	%	2024		2.1 A.1	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義（分子、分母）どのような数字を用いているのか／計算方法は要確認。
3		浄水生産能力	140,000	m ³ /日	2024	地下水32.4% 表流水67.6%	1.2 Basic Indicators 6. Production Capacity 8. Kind of water sources	●	・水道事業の規模感を把握するための指標。
4		給水時間	16	時間/日	2024		2.1 C.1	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日（または1週間）あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多く24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域中で欠けつつある場合、●●●時間／日など短時間単位で記載可。
5		給水水質	水質基準の順守率 100%	—	2024	B.3 Compliance rate of water quality (B.2/B.1) = 1	2.1 B. Drinking Water Quality	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか（浄水場での水質基準順守率）、給水栓での残留塩素濃度を確保する（給水栓での水質基準順守率、残留塩素検出率）、数字の把握が難しい場合は定性的な評価で代替。
6		給水圧	低圧地域での顧客のおよその割合 5%	—	2024		2.1 C.2	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高台や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替（給水栓における水圧について住民から苦情が発生していないか等）。
7		顧客満足度		—		ほぼすべての顧客に満足度調査は実施しているが、数値は不明	2.1 D.	●	・顧客満足度を確保するための指標 ・使用するか水道サービスに満足しているか、例に照して不満を抱えているかを確認する（定性的な評価）。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する（全体的な満足度に加えて、水量（給水時間）・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査）。
財務データ（経営・財務指標#14-25を自動計算）									
			単位	データ年	出典		財務項目	特記事項	
a	BS	流動資産	948,907,326	現地通貨	2023	2023 Financial Statement	Current Assets		
b		現金金	320,157,522	現地通貨	2023	2023 Financial Statement	Cash & Cash Equivalents		
c		固定資産	22,153,660,209	現地通貨	2023	2023 Financial Statement	Non-Current Assets		
d		資産合計	23,102,567,535	現地通貨	2023	2023 Financial Statement	Total Assets		
e		一年前の資産合計	23,909,757,018	現地通貨	2023	2023 Financial Statement	Total Assets		
f		固定負債	17,212,701,890	現地通貨	2023	2023 Financial Statement	Non-Current Liabilities		
g		有利子固定負債	17,212,701,890	現地通貨	2023	2023 Financial Statement	Long Term Loan		
h	PL	自己資本	-2,862,637,246	現地通貨	2023	2023 Financial Statement	Capital		
i		売上高	356,052,096	現地通貨	2023	2023 Financial Statement	「Total Income」-「Bank Interest」	厳密には売上高と異なるかと思いますが、便宜上PL上の数値から左記の計算で求めています。	
j		営業利益	-839,017,805	現地通貨	2023	2023 Financial Statement	「Excess of expenditure over Income」-「Bank Interest」	厳密には営業利益と異なるかと思いますが、便宜上PL上の数値から左記の計算で求めています。	
k		経常利益	-3,273,039,016	現地通貨	2023	2023 Financial Statement	Excess of Expenditure over Income	特別損益、税金費用不明のため、純利益と同じ数値を記載しています。	
l		減価償却費	942,209,558	現地通貨	2023	2023 Financial Statement	Depreciation		
m		金融収益	26,599,236	現地通貨	2023	2023 Financial Statement	Bank Interest		
n		料払い	2,460,820,447	現地通貨	2023	2023 Financial Statement	Financial Expenses	「Financial Expenses」の内部のうち、「Bank charge」と「FDR Excise Duty」をまとめていく判断つきませんでした。表記はご自身も含めた記載です。	
o	CF	補助金 (長期前受金収入)	138,599,000	現地通貨	2023	2023 Financial Statement	Govt. Grant Against Street Hydrant & HTW		
p		純利益	-3,273,039,016	現地通貨	2023	2023 Financial Statement	Excess of Expenditure over Income		
q		EBITDA	103,191,753	現地通貨	2023	2023 Financial Statement			
r		営業CF	-2,347,879,646	現地通貨	2023	2023 Financial Statement	Net Cash used in Operating Activities		
s		投資CF	-50,553,473	現地通貨	2023	2023 Financial Statement	Net Cash used in Investing Activities		
t		為替	1283060	現地通貨/円換算レート	2024	rate202501.pdf			
経営・財務指標									
8	経営状況	会計制度	企業会計	—				●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準						●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水質等の改善後に料金値上げを行った場合、料金徴収率に影響がいか等を確認し、クラスタ事業戦略のシナリオを確認する。 ・データの計算法としては、①「営業収益（利益）を有利子負債で割る方法（日本では「債務対価」と呼称）と、②水道料金表から標準家庭において1か月水道を利用した場合の料金を算出し、単位水量あたりの料金を求める方法がある。世帯別NETではなく世帯別、水使用量が少ない世帯等に1か月に6m ³ を使用する場合の水道料金をデータサービスにしているが、より標準的な使用量として1か月に20m ³ を越えた場合で計算しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためのには①がよく、住民の支払い能力や支払い意志の高さと比較する場合には②が用いられる。 ・1世帯あたりの収入がわかる場合、水道料金負担と比較する（目安は3〜5倍程度）。
10		料金徴収率	90%以上	%	2024		2.2 H.1	●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発行した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水質等の改善や漏れへの移行によって向上する確認し、クラスタ事業戦略のシナリオを確認する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じるため、料金設定に対する支持が薄れにくくなる。
11		徴収水準	約20	%	2024		2.1 E.1	●	・水道事業体の運営能力を把握するための指標。水道システム（送配水管網）への投入水量から、料金請求対象水量（有利子負債）を差し引いて求めた差額水量を、水道システム投入水量で割って算出。 ・進上国では正確に計算されている事例は多くなく、程度の低い精度である場合は「〇〇%と推定されている」と等と記述する。
12		漏水率		%		年間の配管破損件数400件 (2024年)	2.1 E.2	●	・漏水率のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・進上国では正確に計算されている事例は多くなく、程度の低い精度である場合は「〇〇%と推定されている」と等と記述する。
13		メーター設置率	100	%	2024		2.1 F	●	・促進策料金を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平（浄水場や配水池に近い顧客は過剰に水を使える一方、管網の末端まで配水されない）が生じる。顧客メーターを設置し促進策料金を移行することで、配水（水道サービス）の改善に繋がると、支払い意志が向上すると考えられる。
14	事業規模	売上高	356 457	百万現地通貨 百万円				●	・水道事業体の規模を把握するための指標。過去のトレンド（水道料金収入の成長、縮小、安定、不安定など）も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするのには一定以上の規模が必要となる。施設費用を含めて水道料金でコストカバーが可能か規模の目安としては、日本の水道事業体の実績をみると、給水人口10万人以上、導送配水管網あたりの給水人口150人以上と考える。
15		純利益	-3,273 -4199.50544	百万現地通貨 百万円				●	・水道事業体が（特殊な場合も含めて）得た総合的な収益力（規模）を把握するための指標。 ・総利益率に関する指標（自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど）は収益性を把握するデータとしてよく利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストカバーするのには一定以上の規模が必要と考えられる。
16		EBITDA	103,191,753 132,401,2106	百万現地通貨 百万円				※	・水道事業体などの程度のキャッシュフローを創出する能力（規模）があるかを把握するための指標。 ・計算式：営業利益（Operating Profit）-各種償却費（Depreciation）もしくは（Depreciation and amortisation charges） ・水道事業のよに設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。
17		EBITDAマージン	29%	%				※	・活用可能なキャッシュフロー創出能力を把握するための指標。水道事業のよに設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高（Sales）または（Income） ・指標の目安：30%以上が目。世帯別のUtility of the FutureではWorld Classの上下水道事業体の間値を30%と設定。
18		収益性	総資産営業利益率（ROA）	-4%	%			※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献しているかと判断できる。クラスタ事業戦略において、資産規模を増やし収益性を高めるアプローチを用いており、係る成果を確認する。 ・計算式：営業利益（Operating Profit）/ 総資産（Total Assets） ・指標の目安：5%以上が目。
19		売上高経常利益率（長期前受金収入を除く）	-958%	%				※	・営業活動（水道事業）と財務活動（受取利息）に関する経営効率（受取利息を含み、通常の経営活動の効率）を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく（経営効率の改善を目指しており、係る成果を確認する。 ・計算式：（経常利益（Ordinary Profit）-補助金（長期前受金収入）（Government and other grants等））/ 売上高（Income） ・指標の目安：15%以上が目。
20	安全性	自己資本比率	-12%	%				※	・資金調達面（BSの右側）での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本（Total Equity, Capital）/ 総資産（Total Assets） ・指標の目安：40%以上が目（収益性の高い事業体の場合は30%以上）
21		固定長期適合率	154%	%				※	・資本構成上の安全性（固定資産を固定負債と自己資本で賄えているか）を確認する指標。長期借入金及び自己資本の範囲内の投資になっている場合、資金繰りが圧迫される。水道事業は固定資産の割合が大きいため注意。 ・計算式：固定資産（Non-current Assets）/ 固定負債（Non-current Liabilities）+ 自己資本（Total Equity） ・指標の目安：100%を上回る場合は要注（固定資産の割合が流動負債の割合を超過している状態）
22		インタレストカバレッジレシオ	-0.330168178	倍				※	・フロー面から見た安全性を把握するための指標。債務返済能力（利息を支払うだけの利益を確保しているか）を確認。 ・計算式：（営業利益（Operating income）+ 金融収益（受取利息（Interest income））+ 配当金（Dividend income））/ 支払利息（Interest expense） ・指標の目安：1.0倍を下回る場合は要注（金融費用が事業利益を上回っている状態）
23		EBITDA有利子負債倍率	163.7005272	倍				※	・資金繰りからの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するもの、有利子負債の返済に要する平均返済額を示す指標。 ・計算式：有利子負債（Liability with interest）- 現金金（Cash and deposits）/ EBITDA ・指標の目安：3倍以下が目（成長ステージに依る）
24		シュロー	フリーキャッシュフロー	-2398.433119 -3077.333598	百万現地通貨 百万円			※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期〜成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎた後期にあると考えられる。 ・計算式：営業キャッシュフロー（Cash flows from operating activities）- 投資キャッシュフロー（Cash flows from investing activities）
25		営業キャッシュフローマージン	-659%	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益（PLの数値）が大きいほど、本指標の数値が高い場合、債務支払いが滞る（マイナスの場合は高水準な）可能性がある。 ・計算式：営業CF/売上高 × 100 % ・指標の目安：15%以上が目（要注）
指標・備考欄									

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

「JICAグローバル・アジェンダ」持続可能な水資源の確保と水供給」クラスター事業戦略「水道事業体成長支援」モニタリングシート

国名:タンザニア国 水道事業体名:ダルエスサラーム上下水道公社(Dar es Salaam Water and Sewerage Authority (DAWASA))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 （調査数）	613,104,560	人	2023	No.2 DB 参照 総人口(8,664,180)×給水普及率(75%)で計算	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-「水道事業の規模拡大を把握するための指標」 -一般に水道事業者が把握しているものは、水道利用人口よりも低く、料金徴収の単位である給水粒数（接続数）であるため、給水粒数（接続数）を記載しているものとする。
			409,717	件数	2023	No.2 DB 参照	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA		
	事業規模	給水管及率	92	%	2023	No.2 DB参照 給水区域内の給水人口	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-水道事業者は対象エリアの需要を満たしているのかを把握するための指標 -計算式：給水人口 / 給水対象エリアの人口 -普及率の定義（分子、分母にどのような数字を用いているのか）や計算方法は要確認。
		浄水生産能力	524,148	m³/日	2023	No.1 DB参照	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-水道事業者の規模感を把握するための指標。
	サービス水準	給水時間	19	時間/日	2023	No.1 DB参照	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-水道事業者の運転稼働管理能力を示し、水道サービスの水準・顧客満足度を把握するための指標。 -給水時刻ではなく稼働時間を示していることには注意が必要。一般的に稼働時間は24時間を超えており、一部の時間帯に水を採用する理由としては、①配水可能な水の量の対的に不足している、②漏水が多いため稼働時間が増加するなど挙げられる。 -給水区域中で必ずつながりがある場合、●・■・時/日を付した表記も可とする。
		給水水质	大腸菌 8割 遵守 硬度 90% 遵守 残留塩素 19% 遵守 pH 100% 遵守	—	2023	No.2 DB参照	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-水道事業者の運転稼働管理能力を示し、水道サービスの水準・顧客満足度を把握するための指標。 -浄水場出口の水質が基準値以下か、かつ浄水場の設備状況と予測塩素濃度を確認する（給水での水質基準を守り、異常発生報告等）。検査の不備がない場合は定性的な評価で代替。 -定性的な評価として、使用客から苦情が発生していない等も確認する。
7	顧客満足度	給水圧	不明	—	—	No.2 DB参照	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-水道事業者の運転稼働管理能力を示し、水道サービスの水準・顧客満足度を把握するための指標。 -高圧の中程の範囲とならば、水圧が高くなる箇所でもモニタリングポイントとして選定し、高圧になるかどうかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替（給水圧における水圧について住民から苦情が発生しないなど同程度）とする。
		顧客満足度	不明	—	2023	No.2 DB 参照 No.4 DB 参照 顧客サービスについては、DAWASO章にて既に、各々水道会社 WISA の企業計画としてのコメントがある。	WATER UTILITIES PERFORMANCE REVIEW REPORT FOR FINANCIAL YEAR 2022/23 by EWURA	●	-「顧客満足度は確認するための指標」 -使用者が「水道サービスに対して満足しているか、例として不満を抱えているかを検証する」（定性的な評価） -満足度の測定方法（アンケート調査による）、水質・水圧・水道事業者の顧客サービス・水道料金等の項目ごとの満足度の調査)

附添データ(経営・財務指標#14-25を自動計算)			単位	2022/2023	出典	財務項目	特記事項
a	BS	流動資産	249,453,031.000	現地通貨	DAWASA_Report of the controller and auditor general on the financial audit for the financial year ended 30 June 2023	Current assets	
b		現金	112,898,838.000	現地通貨		Cash and cash equivalents	
c		固定資産	1,008,369,189.000	現地通貨		Non-current assets	
d		資産合計	1,257,822,220.000	現地通貨		Total assets	
e		一年前の資産合計	1,088,307,020.000	現地通貨		Total assets	
f		固定負債	8,684,968.000	現地通貨		Non-current liabilities	
g		有利子固定負債	8,684,968.000	現地通貨		Borrowings (non-current portion)	
h		自己資本	882,857,818.000	現地通貨		Total shareholder's equity	
i	PL	売上高	296,265,728.000	現地通貨		Total revenue	
j		営業利益	186,018,336.000	現地通貨			
k		経常利益	109,600,653.000	現地通貨			
l		減価償却費	24,499,424.000	現地通貨			
m		金融収益	0	現地通貨		Depreciation	
n		利払い	646,739.000	現地通貨		Finance cost	
o		補助金 (長期前受金戻入)	147,952,333.000	現地通貨		Total revenue from non-exchange transactions	
p		純利益	108,862,775.000	現地通貨		Surplus for the year	
q	CF	EBITDA	134,780,433.000	現地通貨			
r		営業CF	-3,907,170.000	現地通貨		Net cash (used in)/ generated from operations	
s		投資CF	-162,565,679.000	現地通貨		Net cash used in investing activities	
t		為替	0.05647	銀行買入/円換			

[illegible]

(留意点)

- ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスター事業戦略「水道事業体成長支援」モニタリングシート

国名:ザンビア 水道事業体名:ルサカ上下水道公社(Lusaka Water and Sewerage Company (LWSO))

[illegible]

(留意点)

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

Appendix 4 Monitoring Sheet

Appendix 4.3 Category C (6 utilities)

国名：フィリピン

水道事業体名：マトロセブ水道区 (Metropolitan Cebu Water District (MCWD))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口(顧客数)	205,882	人	2023	接続数	Annual Report 2023	●	・水道事業の規模感を把握するための指標。 →一般に水道事業体を把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。
2		給水管及率	32	%	2023		Annual Report 2023	●	・水道事業体が対象エリアの水需要を満たせているのかを把握するための指標。 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数値を用いているのか)や計算方法は要確認。
3		浄水生産能力	276,058	m ³ /日	2023		Annual Report 2023	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	22	時間/日	2023		2023 Utility Promise Graphs (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in Asia)	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではな(時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多量に発生して漏水量が増加する、等が挙げられる。 ・給水区域によって異なる場合、●を複数箇所で記載した方がよい。
5		給水水量	100	—	2023		Site visit	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準値守率)、給水枝での残留塩素濃度を把握する(給水枝での水質基準値守率、残留塩素検出時)、公平の配給が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧	74.7% (24/7)	—	2023		Site visit	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高圧や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(給水枝における水圧について住民から苦情が発生していないか等)。
7		顧客満足度	93	—	2021		Customer Satisfaction Report 2021	●	・顧客満足度を把握するための指標。 ・指標が水道サービスに直接関連しているか、何に関して不満を抱えているかを把握する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスクープに含めることも検討する(全体の満足度に加えて、水量(給水時間)・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)					単位	データ年	出典	財務項目	特記事項
a	BS	流動資産	2,411,736,787	現地通貨	2023	2023 Financial Statement		Total Current Assets	
b		現金金	1,408,478,480	現地通貨	2023			Cash and Cash Equivalents	
c		固定資産	3,225,440,099	現地通貨	2023			Total Non-Current Assets	
d		資産合計	5,637,176,886	現地通貨	2023			Total Assets	
e		一年前の資産合計	5,245,458,890	現地通貨	2023			Total Assets	
f		固定負債	747,543,794	現地通貨	2023			Total Non-Current Liabilities	
g		有利子固定負債	313,926,979	現地通貨	2023			Financial Liabilities	
h		自己資本	4,054,217,426	現地通貨	2023			Total Equity	
i	PL	売上高	2,071,528,856	現地通貨	2023			Total Income	
j		営業利益	59,405,055	現地通貨	2023			Service and Business Income <i>Operating Income</i>	
k		経常利益	59,248,662	現地通貨	2023			Profit before tax	
l		減価償却費	183,311,181	現地通貨	2023			Total Depreciation <i>Amortization – Intangible Assets</i>	
m		金融収益	10,254,463	現地通貨	2023			Interest Income	
n		利払い	11,846,993	現地通貨	2023			Financial Expenses	
o		補助金(長期前受金収入)	5,642,701	現地通貨	2023			Shares, Grants and Donations	
p		純利益	48,521,215	現地通貨	2023			Net Income	
q	CF	EBITDA	242,716,235	現地通貨	2023			Net Cash Provided by Operating Activities	
r		営業CF	180,094,280	現地通貨	2023			Net Cash Used in Investing Activities	
s		投資CF	-228,293,172	現地通貨	2023			Net Cash Used in Investing Activities	
t		為替	2,585,900	現地通貨/円換算レート					2024年12月JICA換算レート
経営・財務指標									
8		会計制度	PFRS	—	—			●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	30.7	—	—	Supply Price (Currency/m ³)		●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率に影響がないかを確認し、クラスタ事業戦略のシナリオを検証する。 ・データの計算方法としては、①営業収益/料金収入を有収水量で算出する方法(日本では(供排水単価)と呼称)と、②水道料金表から標準家庭において1か月水使用量を利用した単価を算出して、単価が水量あたりの料金を求める方法がある。世帯BENETでは前者を採用し、水使用量の少ない貧困層を全額1か月1㎡に使用する場合の水道料金をデータベース化しているが、より標準的な使用量として1㎡120m ³ を想定して算出しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するために(目安)がよく、住民の支払い能力や支払い意志額と比較する場合にはよく用いられる。 ・1世帯あたりの収入がある場合、水道料金負担と比較する(目安は3～5%程度)。
10	経営状況	料金徴収率	81.2	%	2023		Site visit	●	・水道事業体の料金回収能力を確認するための指標。 ・ある期間に発生した水道料金の収支に際する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスタ事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平が生じるため、料金改定に対する支持が得られにくくなる。
11		徴収水準	33.38	%	2023		Annual Report 2023	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)と算出して求めた徴収率を、有収水量を投入水量で割って算出。 ・送上面では正確に計算されている事例は多くなく、精度の低い推定値である場合は「〇〇%と推定されている」と等と記述する。
12		漏水率	32.33	%	2023		Water balances 2023	●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・送上面では正確に計算されている事例は多くなく、精度の低い推定値である場合は「〇〇%と推定されている」と等と記述する。
13		メーター設置率	100	%	2023		Annual Report 2023	●	・従量制を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では無駄な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は配水に水を使え一方、管網の末端まで配水されない)が生じる。顧客メーター設置(従量制)に移行することで、配水(水道サービス)の改善に繋がり、支払い意欲が向上すると考えられる。
14	事業規模	売上高	2,071.5	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド/水道料金収入の成長、縮小、安定、不安定なども確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要となる。施設費を含めて水道料金でコストリカバリーが可能な規模の目安としては、日本の水道事業体の年間売上と、給水人口10万人以上、家庭配水管1mあたりの給水人口150人以上と考えられる。
15		純利益	48.5	百万現地通貨				●	・水道事業体が(特殊要因も含めて)持続的な収益能力(規模)を把握するための指標。 ・純利益率に関する指標(自己資本当期純利益率、ROE、総資産当期純利益率、ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要と考えられる。
16		EBITDA	242.7	百万現地通貨				※	・水道事業体などの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各資産減価償却(Depreciationもしくは Depreciation and amortization charges) ・水道事業のように設備投資が多く(償却費用)の大きい場合の収益性を分析する際に用いられる。
17		EBITDAマージン	11.72%	%				※	・運用可能なキャッシュフロー創出能力を把握するための指標。水道事業のように設備投資が多く(償却費用)の大きい場合の収益性を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の目標を30%と設定。
18	収益性	総資産営業利益率(ROA)	1.09%	%				※	・総資産に対する収益性を把握するための指標。管理が難しいが、投資した資産が効率的に収益に貢献しているか判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げていると、係数成果を把握する。 ・計算式：営業利益(Operating Profit)/総資産 (Total Assets) ・指標の目安：15%以上が目標。
19		売上高経常利益率(長期前受金収入を除く)	2.59%	%				※	・営業活動(水道事業)と財務活動に関する経常効率(変動的な利益率)を、通常の経常活動の効率を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく(経常効率の改善を目指しており、係数成果を把握する。 ・計算式：(経常利益(Ordinary Profit)-補助金(長期前受金収入)(Government and other grants等))/売上高 (Income) ・指標の目安：15%以上が目標。
20		自己資本比率	71.92%	%				※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本 (Total Equity, Capital)/総資産 (Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)。
21	安全性	固定長期適合率	67.17%	%				※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期前入金及び自己資本の範囲内の投資にない限りは、資金調達が必要となる。水道事業は固定資産の割合が大きいという点に留意。 ・計算式：固定資産 (Non-current Assets)/固定負債 (Non-current Liabilities)+自己資本 (Total Equity) ・指標の目安：100%を上回る場合は要注意(固定資産の一部を流動負債で賄っている状態)。
22		インタレストカバレッジレシオ	5.88	倍				※	・フロー(収入)と、返済(支出)を比較する指標。返済能力(利息を支払う)の利益を確保しているかを確認。 ・計算式：(営業利益(Operating income)+金融収益(Interest income))/配当金(Dividend income)/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要注意(金融負荷が事業利益を上回っている状態)。
23		EBITDA有利子負債倍率	-4.51	倍				※	・返済能力の面からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する平均年額を示すと解釈される。 ・計算式：(有利子負債(Liability with interest)-預当金 (Cash and deposits))/ EBITDA ・指標の目安：15%以下が目標(成長ステージに依る)。
24	キャッシュフロー	フリーキャッシュフロー	-48.20	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間～成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー (Cash flows from operating activities)-投資キャッシュフロー (Cash flows from investing activities)
25		営業キャッシュフローマージン	8.7%	%				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断する可能性の指標。営業利益(PL)の数値が正しくても、本指標の数値が低い場合、償却支払いが滞る(マイナスの場合は赤字状態)可能性がある。 ・計算式：営業CF/売上高×100 [%] ・指標の目安：15%以上が目安(要精査)。
分析欄・備考欄				—	—	—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、命題段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

国名：マダガスカル 水道事業体名：電力水道公社(Jiro Sy Rano Malagasy (JIRAMA))									
No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリグに必要	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	4,081,410	人	2023		JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.	●	・水道事業の規模感を把握するための指標 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水枚数(接続数)であるため、給水枚数(接続数)を記載してもよい。
2		給水管及事	56	%	2023		JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.	●	・水道事業体が対象エリアの水需要を満たせているかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母にどのような数字を用いているのか)や計算方法は要確認。
3		浄水生産能力	403,654	m ³ /日	2023		DONNEES FINANCIERES ET EXPLOITATION EAU JIRAMA_Enxixix	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	16	時間/日	2023	It is between 2 - 16h. It depends on the sites and the period (dry season) (2022, 2023).	JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・適切な給水時間(1日(24時間)あたり)の給水時間を記載し、一般に、給水時間の水を使用する理由としては、①配水可能な水量の絶対的に不足している、②漏水が多く24時間給水では漏水が増加する、等が挙げられる。 ・給水区域中ではばらつきがある場合、●→※時間/日など幅を持たせた記載も可。
5		給水水質	95	—	2023	Quality of water supplied (Compliance rate: %)	JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質の問題ないか(浄水場での水質基準遵守)、給水後の管路運送漏損を確認する(給水枚での水質基準遵守率、残留塩素検出率)、数字の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないか等も確認する。
6		給水圧	65	%	2023		JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高台や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として選定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替(給水枚における水圧について住民から苦情が発生していないか等)。
7		顧客満足度	58	%	2021		2023 Utility Profile Gramps (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in S.A.)	●	・顧客満足度を把握するための指標 ・使用者が水道サービスに対して満足しているか、何に際して不満を抱えているかを把握する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスコアに含めることも検討する(全体の満足度に加えて、水質、給水時間、水費、水圧、水道事業体の顧客対応、水道料金等、項目ごとの満足度を調査)。
財務データ(経営・財務指標#14-25を自動計算)				単位	データ年	出典	財務項目		特記事項
a	BS	流動資産	2,035,346	現地通貨	2022	2022 Financial Statement	Total actifs courants		
b		現金金	103,286	現地通貨	2022	2022 Financial Statement	TRESORERIE ET EQUIVALENTS DE TRC-LOCALITE		
c		固定資産	1,318,648	現地通貨	2022	2022 Financial Statement	Total actifs non courants		
d		資産合計	3,353,993	現地通貨	2022	2022 Financial Statement	TOTAL DES ACTIFS		
e		一年前の資産合計	2,945,430	現地通貨	2022	2022 Financial Statement	TOTAL DES ACTIFS		
f		固定負債	3,148,128	現地通貨	2022	2022 Financial Statement	Total passifs non courants		
g		有利子固定負債	1,597,136	現地通貨	2022	2022 Financial Statement	Emprunts et dettes financie res		
h		自己資本	-2,441,725	現地通貨	2022	2022 Financial Statement	Total des capitaux propres		
i		売上高	891,372	現地通貨	2022	2022 Financial Statement	I- PRODUCTION DE L'EXERCICE		うち10%のみが水道事業収入、90%が電力事業収入
j		営業利益	-638,065	現地通貨	2022	2022 Financial Statement	V- RESULTAT OPERATIONNEL		
k	PL	経常利益	-662,177	現地通貨	2022	2022 Financial Statement	VII- RESULTAT AVANT IMPOTS		
l		減価償却費	133,963	現地通貨	2022	2022 Financial Statement	Dotations aux amorts / provisions et pertes de		
m		金融収益	367	現地通貨	2022	2022 Financial Statement	Produits financiers		
n		利払い	24,460	現地通貨	2022	2022 Financial Statement	Charges financie res		
o		補助金 (長期前受金戻入)	500,000	現地通貨	2022	2022 Financial Statement	Subvention		
p		純利益	-666,439	現地通貨	2022	2022 Financial Statement	X- RESULTAT NET DE L'EXERCICE		
q		EBITDA	-504,122	現地通貨	2022	2022 Financial Statement			
r		営業CF	-207,312	現地通貨	2022	2022 Financial Statement	Flux de trésorerie générés par l'activité (A)		
s		投資CF	-52,427	現地通貨	2022	2024年12月JICA精算シート	Flux de Trésorerie liés aux opérations d'investissement (B)		
t		為替	0.032790	現地通貨/円換	2024	rate2024.12.pdf			2024年12月JICA精算シート
経営・財務指標									
8	経営状況	会計制度	企業会計	—	—			●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	939.8	—	—	Supply price (Currency/m ³) (Turnover from sales/ Water sold)		●	・水道料金水準が適切に設定されているか確認するための指標。給水時間、給水圧、給水水質等の改善後に料金値上げを行った場合、料金徴収率に影響がないか等を確認し、クラスター事業戦略のシナリオを検証する。 ・データの計算方法としては、①産出収益(料金収入+有収水量で算出する方法(※供給漏損とを物)と、②水道料金表から事業年度において1か月水代を利用した場合の料金を算出して、単位産出量あたりの料金を求める方法がある。世帯1戸あたりを仮定し、1戸あたり100m ³ を仮定して計算しているケースあり。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するためには①がより、住民の支払い能力や支払い意欲と比べると比較できる方法が有効。 ・1戸あたりの収入がわかる場合は、水道料金負担と比較する(目安は3～5%程度)。
10		料金徴収率	110	%	2023	JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.		●	・水道事業体の料金徴収能力を確認するための指標。 ・ある期間に発生した水道料金の請求書の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水質等の改善や従量制への移行によって向上するが確認し、クラスター事業戦略のシナリオを検証する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平感が生じたり、料金徴収に対する支持が得られにくくなる。
11		徴収水準	55.1	%	2023	JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.		●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)を差し引いて求めた無収水量を、水道システム投入水量で割って算出。 ・※上図では正確に計算されている事例は多くなく、精度の低い推定値であるその場合は①〇%と推定されている②等と記述する。
12		漏水率	—	%	—			●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・※上図では正確に計算されている事例は多くなく、精度の低い推定値であるその場合は①〇%と推定されている②等と記述する。
13		メーター設置率	100	%	2023	JIRAMA's responses to the questionnaire of "the study on growth of water utilities" recorded on 8 Nov 2024.		●	・従量制を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では正確な利益が得られず、それによって配水の公平(浄水場配水水量)に歪みが生じ、配水に水を使用する一方、管網の末端まで配水されないが生じ、顧客メーターを設置し従量制に移行することで、配水(水道サービスの改善)に繋がったり、支払い意欲が向上すると考えられる。
14		売上高	0.89	百万現地通貨	—			●	・水道事業体の規模を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみにコストリターンするためには一定以上の規模が必要となる。施設費用を含めて水道料金コストリターンが可能な規模の目安として、日本の水道事業体の実績をみると、給水人口10万人以上、浄水場100m ³ あたりの給水人口150人以上と考える。
15		事業規模	純利益	-0.67	百万現地通貨	—		●	・水道事業体が(特異要因も含めて)得た総合的な収益力(損益)を把握するための指標。 ・純利益に関する指標(自己資本当期純利益率・ROE、総資産当期純利益率・ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリターンするためには一定以上の規模が必要と考えられる。
16		安全性	EBITDA	-0.50	百万現地通貨	—		※	・水道事業体がどの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)+減価償却費(Depreciation)もしくは(Depreciation and amortization charges) ・水道事業のよう設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。
17			EBITDAマージン	-56.6%	%	—		※	・活用可能なキャッシュフロー創出力を把握するための指標。水道事業のように設備投資が多く償却費負担の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の目標を30%と設定。
18	収益性		総資産営業利益率(ROA)	-20.3%	%	—		※	・総資産に対する収益性を把握するための指標。数値が高いほど、投資した資産が効率的に収益に貢献しているかと判断できる。クラスター事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げている限り、係る成果を確認する。 ・指標の目安：5%以上が目標。
19	売上高経常利益率(長期前受金戻入を除く)		-130.4%	%	—			※	・営業活動(水道事業)と財務活動に関する経営効率(変動的な損益を含まない、通常の経営活動の効率)を把握するための指標。クラスター事業戦略では、規模を上げただけでなく経営効率の改善を目指しており、係る成果を確認する。 ・計算式：(経常利益(Ordinary Profit)-補助金(長期前受金戻入)(Government and other grants等))/売上高(Income) ・指標の目安：15%以上が目標。
20	自己資本比率		-72.8%	%	—			※	・資金調達面(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)
21	安全性	固定長期適合率	186.7%	%	—		※	・資本調達上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借入金及び自己資本の範囲内の安全額(Non-current Assets)/(固定負債(Non-current Liabilities)+自己資本(Total Equity)) ・指標の目安：100%を上回る場合は要留意(固定資産の一部を流動負債で賄っている状態)	
22		インタレストカバレッジレシオ	-26.07	倍	—		※	・フロー面から見た安全性を把握するための指標。債務返済能力(利息を支払うだけの利益を確保しているか)を確認。 ・計算式：(営業利益(Operating income)+金融収益(受取利息, Interest income)+配当金(Dividend income))/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要留意(金融費用が事業利益を上回っている状態)	
23		EBITDA有利子負債倍率	-2.96	倍	—		※	・資金確保の面からの安全性を把握するための指標。EBITDAはキャッシュ創出力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式：有利子負債(Liability with interest)-返済金(Cash and deposits)/EBITDA ・指標の目安：1.0倍以下が目標(返済コストに余裕)	
24		キャッシュフロー	フリーキャッシュフロー	-0.26	百万現地通貨	—		※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間→低成長、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)
25		営業キャッシュフローマージン	-23.3%	%	—			※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PLの数値)が高くとも、本指標の値が低い場合、償還支払いが滞る(マイナスの場合は償還滞り)する可能性がある。 ・計算式：営業CF/売上高×100 (%) ・指標の目安：15%以上が目安(要確認)
分析値・備考欄				—	—	—			

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。

2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標として、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：ウガンダ

水道事業体名：国家上下水道公社 (National Water and Sewerage Corporation (NWSO))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必要	位置付け／記入上の留意点／計算式																																																							
水道サービス指標																																																																
1	事業規模	給水人口 (顧客数)	17,585,238	人	2022		2024 Utility Profile Update (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in JICA Utility Profile Update)	●	・水道事業の規模感を把握するための指標 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水栓数 (接続数) であるため、給水栓数 (接続数) を記載してもよい。																																																							
2		給水管長さ	84	%	2022		2024 Utility Profile Update (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in JICA Utility Profile Update)	●	・水道事業体が対象エリアの水需要を満たしているかを把握するための指標 ・計算式：給水人口 / 給水対象エリアの人口 ・普及率の定義 (分子、分母) による数字を用いているのかや計算方法は要確認。																																																							
3		浄水生産能力	702,563	m ³ /日	2022		2024 Utility Profile Update (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in JICA Utility Profile Update)	●	・水道事業の規模感を把握するための指標。																																																							
4	サービス水準	給水時間	20	時間/日	2022		2024 Utility Profile Update (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in JICA Utility Profile Update)	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではな(時間給水の場合、1日または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、1.配水可能な水量の絶対的に不足している、2.漏水が多(24時間給水では漏水量が増加する、等)挙げられる。 ・給水区域で十分な量がある場合、●を●●●●と記述してよい。																																																							
5		給水水量	98.5	%	2023	Quality of water supplied (Compliance rate: %)	Corporate Plan 2024-2027, NWSO	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準準守率)、給水栓での残留塩素濃度を把握する (給水栓での水質基準準守率、残留塩素検出率)。数々の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していないかも確認する。																																																							
6		給水圧	カンハラから離れるほど水圧が低くなる	—	—		Corporate Plan 2024-2027, NWSO	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・混合や管線の老朽など、水圧が最も低くなる箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。定量的な把握が難しいことも多く、その場合は定性的な評価で代替 (例えば給水栓における水圧について、住民から苦情が来ているかなど)。																																																							
7		顧客満足度	86	%	2023		Corporate Plan 2024-2027, NWSO	●	・顧客満足度を把握するための指標 ・度合いが水道サービスに対して適切であるか、何に際して不満を抱えているかを把握する (定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスクープに含めることも検討する (全体的な満足度に加えて、水量・給水時間・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)。																																																							
財務データ (経営・財務指標#14-25を自動計算)																																																																
				単位	データ年	出典	財務項目	特記事項																																																								
a	BS	流動資産	672,087,341	現地通貨	2023	2024 Financial Statement	Total current assets																																																									
b		現預金	274,608,454	現地通貨	2023	2024 Financial Statement	Cash and bank balances																																																									
c		固定資産	3,943,867,367	現地通貨	2023	2024 Financial Statement	Total non-current assets																																																									
d		資産合計	4,615,954,708	現地通貨	2023	2024 Financial Statement	TOTAL ASSETS																																																									
e		一年前の資産合計	4,349,420,132	現地通貨	2023	2024 Financial Statement	TOTAL ASSETS																																																									
f		固定負債	2,745,883,387	現地通貨	2023	2024 Financial Statement	Total non-current liabilities																																																									
g		有利子固定負債	116,634,468	現地通貨	2023	2024 Financial Statement	Borrowings																																																									
h		自己資本	1,502,114,054	現地通貨	2023	2024 Financial Statement	Lease Obligations																																																									
i			売上高	622,225,721	現地通貨	2023	2024 Financial Statement	Total Income																																																								
j			営業利益	41,920,760	現地通貨	2023	2024 Financial Statement	Operating profits before finance costs																																																								
k	PL	経常利益	21,861,381	現地通貨	2023	2024 Financial Statement	Net (Loss) Profit Before Tax																																																									
l		減価償却費	100,312,280	現地通貨	2023	2024 Financial Statement	Depreciation and amortisation																																																									
m		金融収益	n/a	現地通貨	2023	2024 Financial Statement	n/a	「financial cost」がnet表記のため、「金融収益」と「利払い」の内訳不明																																																								
n		利払い	n/a	現地通貨	2023	2024 Financial Statement	n/a	「financial cost」がnet表記のため、「金融収益」と「利払い」の内訳不明																																																								
o		補助金 (長期前受金控入)	936,766,329	現地通貨	2023	2024 Financial Statement	n/a																																																									
p		純利益	60,360,639	現地通貨	2023	2024 Financial Statement	Profit (Loss) for the year																																																									
q		EBITDA	142,233,020	現地通貨	2023	2024 Financial Statement																																																										
r		CF	営業CF	68,568,708	現地通貨	2023	2024 Financial Statement	Net Cash Flow from Operating Activities																																																								
s			投資CF	-389,872,332	現地通貨	2023	2024 Financial Statement	Net Cash Flow from Investing Activities																																																								
t			為替	0.041390	現地通貨/円換算レート	2023	rate202412.pdf		2024年12月JICA計算シート																																																							
経営・財務指標																																																																
8	経営状況	会計制度	企業会計	—	—			●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。																																																							
9		水道料金水準	<table><tr><td colspan="4">Table 6: Water tariff structure</td></tr><tr><td>Category</td><td>Unit</td><td>Price per unit (USD per 1000 litres)</td><td>Price per unit (JPY per 1000 litres)</td></tr><tr><td>Basic fee</td><td>USD</td><td>0.5</td><td>73.5</td></tr><tr><td>Volume charge</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Connection fee</td><td>USD</td><td>100</td><td>14,700</td></tr><tr><td>Capital cost recovery</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Depreciation</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Operating cost</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on capital</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on debt</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on equity</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on loan</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on bond</td><td>USD</td><td>0.1</td><td>14.7</td></tr><tr><td>Interest on share</td><td>USD</td><td>0.1</td><td>14.7</td></tr></table>	Table 6: Water tariff structure				Category	Unit	Price per unit (USD per 1000 litres)	Price per unit (JPY per 1000 litres)	Basic fee	USD	0.5	73.5	Volume charge	USD	0.1	14.7	Connection fee	USD	100	14,700	Capital cost recovery	USD	0.1	14.7	Depreciation	USD	0.1	14.7	Operating cost	USD	0.1	14.7	Interest on capital	USD	0.1	14.7	Interest on debt	USD	0.1	14.7	Interest on equity	USD	0.1	14.7	Interest on loan	USD	0.1	14.7	Interest on bond	USD	0.1	14.7	Interest on share	USD	0.1	14.7	—	2024	Corporate Plan 2024-2027, NWSO	●	・水道料金水準が適切に設定されているかを確認するための指標。・給水時間、給水圧、給水水量等の改善後に料金値上げを行った場合、料金徴収率・前年比がどうかを確認し、クラスタ事業戦略のシナリオを確認する。 ・データの計算方法としては、1.適量給水 (料金収入を収支水量で割る方法)、2.日本では「接続料金」と呼ぶと、2.水道料金費から標準事業において毎月水道を利用した場合の料金を算出して、標準水量あたりの料金を求める方法がある。世帯100戸では2.を2倍し、使用量の少ない賃貸借を考慮し1か月以内に3倍使用する場合は水道料金を2倍にしているが、使用量を問わず、水道事業体全体として水道料金水準を把握するためには1か月ではなく、住民の支払い能力や支払い意欲と比較する場合は2がよい。 ・1世帯あたりの収入がわかる場合、水道料金負担と比較する (目安143→59程度)。
Table 6: Water tariff structure																																																																
Category		Unit	Price per unit (USD per 1000 litres)	Price per unit (JPY per 1000 litres)																																																												
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Interest on loan	USD	0.1	14.7																																																													
Interest on bond	USD	0.1	14.7																																																													
Interest on share	USD	0.1	14.7																																																													
10	料金徴収率	98.0	%	2023		Corporate Plan 2024-2027, NWSO	●	・水道事業体の料金徴収率を確認するための指標。 ・実際には徴収した水道料金の総額に対する、実際に徴収した水道料金の総額に対する。クラスタ事業戦略のシナリオを確認する。 ・給水時間、給水圧、給水水量等の改善や従量制への移行によって向上するが確認し、クラスタ事業戦略のシナリオを確認する。料金徴収率が低い場合、料金支払いの遅延や顧客間に不公平感が生じるため、料金改定に対する支持が得られにくくなる。																																																								
11	徴収水準	35.0	%	2023		Corporate Plan 2024-2027, NWSO	●	・水道事業体の運営能力を確認するための指標。水道システム (送水主管網) への投入水量から、料金請求対象水量 (有収水量) の算出に必要となる収入を算出する。水道システム投入水量に対して算出される収入を算出する。 ・適上では正確に計算されている事例は多くなく、精度の低い確定値である場合は「〇%と確定されている」と等と記述する。																																																								
12	漏水率	26.3	%	2023	無収率 × 0.75		●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・適上では正確に計算されている事例は多くなく、精度の低い確定値である場合は「〇%と確定されている」と等と記述する。																																																								
13	メーター設置率	100.0	%	2022		2024 Utility Profile Update (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in JICA Utility Profile Update)	●	・従量料金制を導入しているか、導入できる環境にあるかを確認するための指標。 ・一定額では無収な水利用が発生し、それに起因して配水の不公平 (浄水場や配水池に近い顧客は配水に水を確保する一方、離れた顧客は配水に不利になりがち) が生じる。従量メーターを設置し従量制に移行することで、配水 (水道サービスの改善) により、支払いが公平に向上すると考えられる。																																																								
14	事業規模	売上高	622.23	百万現地通貨				●	・水道事業体の規模感を把握するための指標。過去のトレンド (水道料金収入の成長、縮小、安定、不安定など) も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリカバーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、年産配水100m ³ あたりの給水人口150人以上と考えられる。																																																							
		純利益	60.36	百万現地通貨				●	・水道事業体が (特許要領も含めて) 持続的な収益力 (業績) を把握するための指標。 ・純利益 (純利益) に関する指標。自己資本当期純利益率、ROE、自己資本当期純利益率、ROAなどは収益性を把握するデータとしてよく利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバーするためには一定以上の規模が必要と考えられる。																																																							
15			2.50	百万円																																																												
16			142.23	百万現地通貨				※	・水道事業体がどの程度のキャッシュフローを創出する能力 (規模) があるかを把握するための指標。 ・計算式：営業利益 (Operating Profit) / 各種減価償却費 (Depreciation and amortisation charges) ・水道事業のよに設備投資が多く償却費用の大きい場合の収益力を分析する際に用いられる。																																																							
17		EBITDA	5.89	百万円																																																												
17		EBITDAマージン	22.9%	%				※	・活用可能なキャッシュフロー・創出能力を把握するための指標。水道事業のように設備投資が多く償却費用の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA / 売上高 (Sales) × 100 (Income) ・指標の目安：30%以上が目標。世帯のUtility of the FutureではWorld Classの上下水道事業体の目標を30%と設定。																																																							
18	収益性	総資産営業利益率 (ROA)	0.9%	%				※	・総資産に対する収益性を把握するための指標。価値が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げている限り、低くても成果を達成する。 ・計算式：営業利益 (Operating Profit) / 総資産 (Total Assets) ・指標の目安：15%以上が目標。																																																							
19		売上高経常利益率 (長期前受金控入を除く)	-147.0%	%				※	・営業活動 (水道事業) と財務活動に関する経営効率 (安定的な収益性を含み、通常の経営活動の効率) を把握するための指標。クラスタ事業戦略では、規模を上げただけでなく経営効率の改善を目指しており、低くても成果を達成する。 ・計算式：(営業利益 (Ordinary Profit) - 補助金 (長期前受金控入) (Government and other grants)) / 売上高 (Income) ・指標の目安：15%以上が目標。																																																							
20		自己資本比率	32.5%	%				※	・資金調達源 (BSの右側) での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本 (Total Equity, Capital) / 総資産 (Total Assets) ・指標の目安：40%以上が目標 (収益性の高い事業体の場合は30%以上)。																																																							
21	安全性	固定長期適合率	92.8%	%				※	・資本構成上の安全性 (固定資産と固定負債と自己資本で賄えているか) を確認する指標。長期借入金及び自己資本の範囲内の負債に代わっていない場合、資金調達が安定する。水道事業は固定資産の割合が大きいこと留意。 ・計算式：固定資産 (Non-current Assets) / (固定負債 (Non-current Liabilities) + 自己資本 (Total Equity)) ・指標の目安：100%を超える場合は要留意 (固定資産の一部を流動負債で賄っている状態)。																																																							
22		インタレストカバレッジレシオ	#VALUE!	倍		「financial cost」がnet表記のため、「金融収益」と「利払い」の内訳不明		※	・フリーキャッシュフローを把握するための指標。債務返済能力 (利息を支払うための利益を確保しているか) を確認。 ・計算式：(営業利益 (Operating income) + 金融収益 (Interest income) + 配当金 (Dividend income)) / 支払利息 (Interest expense) ・指標の目安：1.0倍を下回る場合は要留意 (金融費用が営業利益を上回っている状態)。																																																							
23		EBITDA有利子負債倍率	-1.11	倍				※	・資金繰りの面からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を確保するため、有利子負債の返済に要する平均年数を示す指標と解釈される。 ・計算式：(有利子負債 (Liability with interest) / 営業利益 (Cash and deposits)) / EBITDA ・指標の目安：5倍以下が目標 (成長ステージに依る)。																																																							
24	キャッシュフロー	フリーキャッシュフロー	-321.30	百万現地通貨				※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は黎明期→成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー (Cash flows from operating activities) - 投資キャッシュフロー (Cash flows from investing activities)																																																							
25		営業キャッシュフローマージン	-13.30	百万円				※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益 (PL) の数値が低くとも、本指標の数値が高い場合、償却支払いの滞り (マイナスの場合は赤字状態) の可能性がある。 ・計算式：営業CF / 売上高 × 100 (%) ・指標の目安：15%以上が目安 (要留意)。																																																							
分析欄・備考欄				—	—	—																																																										

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体 (水道事業体成長支援型、スケールアップ支援型) については最低限必要な指標とし、データの収集を目指す。

JICAグローバル・アジェンダ「持続可能な水資源の確保と水供給」 クラスタ事業戦略「水道事業体成長支援」モニタリングシート

国名：マラウイ

水道事業体名：リロングウェ水道公社 (Lilongwe Water Board (LWB))

No.	評価項目	モニタリング指標	データ	単位	データ取得年	備考	出典	モニタリングに必須	位置付け／記入上の留意点／計算式
水道サービス指標									
1	事業規模	給水人口 (顧客数)	1,120,085	人	2023		JICA Survey in Nov. 2024	●	・水道事業の規模感を把握するための指標 ・一般に水道事業体が把握しているのは、水道利用人口ではなく、料金徴収の単位である給水数(接続数)であるため、給水数(接続数)を記載してもよい。
2		給水管及率	95	%	2023		JICA Survey in Nov. 2024	●	・水道事業体が対象エリアの水需要を満たせているのかを把握するための指標 ・計算式：給水人口/給水対象エリアの人口 ・普及率の定義(分子、分母)にどのような数字を用いているのかや計算方法は要確認。
3		浄水生産能力	125,000	m ³ /日	2023		JICA Survey in Nov. 2024	●	・水道事業の規模感を把握するための指標。
4	サービス水準	給水時間	22	時間/日	2023		JICA Survey in Nov. 2024	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・連続給水ではなく時間給水の場合、1日(または1週間)あたりの給水時間を記載。一般に、時間給水を採用する理由としては、1日可能な水量の絶対的に不足している、必要水量が多(24時間給水では漏水量が増加する、等が挙げられる。 ・給水区域が広範囲にわたる場合は、朝・昼・夜間、日中給水に別れた記載も可。
5		給水水質	97	—	2023	Quality of water supplied (Compliance rate: %)	JICA Survey in Nov. 2024	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・浄水場出口の水質が問題ないか(浄水場での水質基準遵守)、給水栓での残留性亜硫酸を確認する(給水栓での水質基準遵守率、残留性亜硫酸)。数値の把握が難しい場合は定性的な評価で代替。 ・定性的な評価として、使用者から苦情が発生していない等も確認する。
6		給水圧	3	—	2023		JICA Survey in Nov. 2024	●	・水道事業体の運転維持管理能力を確認し、水道サービス水準・顧客満足度を把握するための指標。 ・高圧や管網の末端など、水圧が最も低くなる箇所をモニタリング地点として測定し、適正な水圧があるかどうかを確認する。定量的な評価が難しいことも多く、その場合は定性的な評価で代替(給水栓における水圧について低減が実施されているか等)。
7		顧客満足度	76	—	2022/2023			●	・顧客満足度を把握するための指標 ・使用感が水道サービスに対して満足しているか、何に際して不満を抱えているかを把握する(定性的な評価)。 ・水道サービスの改善が期待できる案件においては、顧客満足度調査をプロジェクトのスクープに含めることも検討する(全体的な満足度に加えて、水量・給水時間・水質・水圧・水道事業体の顧客対応・水道料金等、項目ごとの満足度を調査)
財務データ(経営・財務指標#14-25を自動計算)					単位	データ年	出典	財務項目	特記事項
a	BS	流動資産	63,053,700	現地通貨	2023	2024 Financial Statement		Total current assets	
b		現金金	44,850,867	現地通貨				Cash and cash equivalents	
c		固定資産	228,084,023	現地通貨				Total non-current assets	
d		資産合計	291,137,723	現地通貨				Total assets	
e		一年前の資産合計	202,373,239	現地通貨				Total assets	
f		固定負債	205,465,149	現地通貨				Total non-current liabilities	
g		有利子固定負債	132,075,523	現地通貨				Long term borrowings	
h		自己資本	75,722,947	現地通貨				Total funds	
i		売上高	48,892,814	現地通貨				Revenue Other income	
j	PL	営業利益	17,966,426	現地通貨				Operating profit	
k		経常利益	14,871,383	現地通貨				Profit before income tax	
l		減価償却費	1,126,731	現地通貨				Depreciation	
m		金融収益	398,335	現地通貨				Finance income	
n		利払い	5,376,090	現地通貨				Finance costs	
o		補助金 (長期前受金収入)	1,611,248	現地通貨				n/a	
p		純利益	9,485,104	現地通貨				Profit for the year	
q		EBITDA	19,093,157	現地通貨					
r		CF	営業CF	7,513,110				現地通貨	Net cash (used in)/ generated from operating activities
s	投資CF		-42,228,375	現地通貨				Net cash used before financing	
t	為替		0.087860	現地通貨/円換算レート					2024年12月JICA精算シート
経営・財務指標									
8	事業規模	会計制度	企業会計	—	—	—	—	●	・企業会計の適用有無を確認するための項目。 ・成長する水道事業体の前提条件として、企業会計を適用し、財務三表を用いて経営状況を把握・管理できている必要あり。
9		水道料金水準	2,546/78	—	2023	Water tariff level (USD/6m3)	JICA Survey in Nov. 2024	●	・水道料金水準が適切に設定されているか確認するための指標。・給水時間、給水圧、給水水质等の改善後に料金値上げを行った場合、料金徴収率に影響がないか等を確認し、クラスタ事業戦略のシナリオを確認する。 ・データの計算方法は、①営業利益(料金収入-有収水量で算出する方法(日本では標準))と②水料金を、③水道料金表から標準家庭において毎月水道を利用した場合の料金を算出し、単位水量あたりの料金を求める方法がある。世帯IDNETでは②を採用し、水使用量の少ない貧困層を念頭に1ヵ月に6m3を使用する場合の水道料金をベース化しているが、より標準的な標準家庭として1ヵ月に20m3を想定して計算しているケースもある。 ・用途を問わず、水道事業体全体としての水道料金水準を把握するために①がよく、住民の支払い能力や支払い意欲と比較する場合には②が用いられる。 ・1世帯あたりの収入が平均水準、水道料金負担と比較する(目安は3-5%程度)。
10		料金徴収率	95	%	2023		JICA Survey in Nov. 2024	●	・水道事業体の料金回収能力を確認するための指標。 ・売上高に徴収された水道料金の総額に対する、実際に徴収した水道料金の総額の比率。 ・給水時間、給水圧、給水水质等の改善や従量制への移行によって向上するか確認し、クラスタ事業戦略のシナリオを確認する。料金徴収率が低い場合、料金支払いの有無で顧客間に不公平感が生じるため、料金改定に対する支持が得られにくくなる。
11		徴収水準	40	%	2023		JICA Survey in Nov. 2024	●	・水道事業の運営能力を把握するための指標。水道システム(送配水管網)への投入水量から、料金請求対象水量(有収水量)と見做して算出される徴収水量を、水道システム投入水量で割って算出することで、配水(水道サービス)の改善に繋がり、支払い意欲が向上すると考えられる。 ・売上高では正確に計算されている事例は多くなく、精度の低い規定値である場合は「〇〇%と規定されている」と等と記述する。
12	事業規模	漏水率	—	%	—	—	—	●	・無収水のうち、どの程度が物理的損失であるかを把握し、水道事業体の運転維持管理能力を確認するための指標。 ・売上高では正確に計算されている事例は多くなく、精度の低い規定値である場合は「〇〇%と規定されている」と等と記述する。
13		メーター設置率	100	%	2023		JICA Survey in Nov. 2024	●	・従量制を導入しているか、導入できる環境にあるかを把握するための指標。 ・定額制では無意味な水利用が発生し、それに起因して配水の不公平(浄水場や配水池に近い顧客は配水に水を使える一方、管網の遠端まで配水されない)が生じる。従量メーターを従量制に移行することで、配水(水道サービス)の改善に繋がり、支払い意欲が向上すると考えられる。
14		売上高	48,89	百万現地通貨	—	—	—	●	・水道事業体の規模感を把握するための指標。過去のトレンド(水道料金収入の成長、縮小、安定、不安定など)も確認する。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要となる。施設費用を含めて水道料金でコストリカバリーが可能な規模の目安としては、日本の水道事業体の実績を踏まえると、給水人口10万人以上、年産配水能力100km ³ あたりの給水人口10万人以上と考える。
15		純利益	9,49	百万現地通貨	—	—	—	●	・水道事業体が(特殊要因も含めて)十分な期待収益力(損益)を把握するための指標。 ・純利益率に関する指標(自己資本当期純利益率、ROE、総資産当期純利益率、ROAなど)は収益性を把握するデータとして良く利用される。 ・水道事業は資本集約的な産業であり、水道料金のみでコストリカバリーするためには一定以上の規模が必要と考えられる。
16	事業規模	EBITDA	19,09	百万現地通貨	—	—	—	※	・水道事業体がどの程度のキャッシュフローを創出する能力(規模)があるかを把握するための指標。 ・計算式：営業利益(Operating Profit)/各種償却費(Depreciation and amortisation charges) ・水道事業のように設備投資が多く償却費用の大きい場合の収益力を分析する際に用いられる。
17		EBITDAマージン	39.1%	%	—	—	—	※	・活用可能なキャッシュフロー・創出能力を把握するための指標。水道事業のように設備投資が多く償却費用の大きい場合の収益力を分析する際に用いられる。 ・計算式：EBITDA/売上高(SalesまたはIncome) ・指標の目安：30%以上が目標。世帯のUtility of the FutureでWorld Groupの上下水道事業体の間値を30%と設定。
18		総資産営業利益率(ROA)	7.3%	%	—	—	—	※	・総資産に対する収益性を把握するための指標。負債が高いほど、投資した資産が効率的に収益に貢献していると判断できる。クラスタ事業戦略において、資産規模を増やして収益性を高めるアプローチを掲げている、後者成果を確認する。 ・計算式：営業利益(Operating Profit)/総資産(Total Assets) ・指標の目安：5%以上が目標。
19		売上高経常利益率(長期前受金収入を除く)	27.1%	%	—	—	—	※	・営業活動(水道事業)と財務活動に関する経常効率(安定的な収益を含む)、通常の経常活動の効率)を把握するための指標。クラスタ事業戦略では、規模を上げるだけでなく経常効率の改善を目指しており、後者成果を確認する。 ・計算式：(経常利益(Ordinary Profit)-補助金(長期前受金収入))(Government and other grants等)/売上高(Income) ・指標の目安：15%以上が目標。
20	安全性	自己資本比率	26.0%	%	—	—	—	※	・資金調達源(BSの右側)での安全性を把握するための指標。数値が高いほど経営が安定している。 ・計算式：自己資本(Total Equity, Capital)/総資産(Total Assets) ・指標の目安：40%以上が目標(収益性の高い事業体の場合は30%以上)
21		固定長期適合率	81.1%	%	—	—	—	※	・資本構成上の安全性(固定資産を固定負債と自己資本で賄えているか)を確認する指標。長期借金と自己資本の範囲内の投資に代わっている場合、水道事業は固定資産の割合が高いため注意。 ・計算式：固定資産(Non-current Assets)/(固定負債(Non-current Liabilities)+自己資本(Total Equity)) ・指標の目安：100%を超える場合は要注意。固定資産の一部を流動負債で賄っている状態。
22		インタレストカバレッジレシオ	3.42	倍	—	—	—	※	・フロー・借入・返済・現金を把握するための指標。借入返済能力(利息を支払う)だけの利益を確保しているかを確認。 ・計算式：(営業利益(Operating income)+金融収益(受取利息)(Interest income))/配当金(Dividend income)/支払利息(Interest expense) ・指標の目安：1.0倍を下回る場合は要注意(金融費用が事業利益を上回っている状態)
23		EBITDA有利子負債倍率	4.57	倍	—	—	—	※	・資金利の面からの安全性を把握するための指標。EBITDAはキャッシュ創出能力を意味するため、有利子負債の返済に要する平均年数を示すと解釈される。 ・計算式：(有利子負債(Liability with interest))/現金金(Cash and deposits)/EBITDA ・指標の目安：5倍以上が目標(成長ステージに依る)
24	キャッシュフロー	フリーキャッシュフロー	-34.72	百万現地通貨	—	—	—	※	・水道事業体の成長ステージを把握するための指標。マイナスの場合は短期間→成長期、プラスの場合は成熟期にあり、FCFが高水準から低下している場合、成熟期を過ぎて衰退期にあると考えられる。 ・計算式：営業キャッシュフロー(Cash flows from operating activities)-投資キャッシュフロー(Cash flows from investing activities)
25		営業キャッシュフロー・マージン	15.4%	%	—	—	—	※	・売上高に対して、営業活動を通じた現金収入の割合を確認することで、経営状況を判断するための指標。営業利益(PL)の数値が減少すると、本指標の数値が低い場合、債務支払いが増える(マイナスの場合は赤字状態)可能性がある。 ・計算式：営業CF/売上高×100 [%] ・指標の目安：15%以上が目安(要精査)
分析欄・備考欄				—	—	—	—		

(留意点)

- 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
- ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

水道事業体名: プランタイヤ水道公社 (Blantyre Water Board (BWB))

(留意点)

1. 水道事業体の発展段階に関わらず、全ての水道事業体で「最低限必要な指標」のデータは収集することを目指す。
2. ※の指標は、発展段階の高い水道事業体(水道事業体成長支援型、スケールアップ支援型)については最低限必要な指標とし、データの収集を目指す。

Appendix 5 Excel analysis format for diagnosis of Category B

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic Report -

Samoa Water Authority (SWA)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)

in association with

Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

0. Benchmarks

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. GS diag (Diagnosis based on growth spiral)

0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (WST)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(WST)				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%(15-20%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Accrual basis	—
Profitability		20	Net income (WST)	—	—	—	—
		21	EBITDA (WST)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	—
		26	Equity ratio (%)	—	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (WST/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (WST/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (WST)	—	—	—	—
33		Development Partner grant support (WST)	—	—	—	—	
Human resource efficiency	34	The ratio of subsidies and DP support to turnover	—	—	—	—	
	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0	

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the "Africa Executive Forum Utility Profile" appears to be "operating revenues/operation and maintenance expenses," we added "operating revenues from water services/operation and maintenance expenses" so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

3.66

1.3.70.2013

1.3.70.2013

Unit: Tousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: SWA				Improve ment	Stage of growth				Source				Remarks (Additional information)	Initial diagnosis by indicator	
				2020	2021	2022	2023		2020	2021	2022	2023	2020	2021	2022	2023			
Service level	1. Service Improvement and Investment Activities	1	Investment cost (WST)	11,062,117	9,953,456	6,260,474		↘	-	-	-	-	C	C	C		The priority areas for capital investment in the next 3 years: - Water resource development - Network expansion - Rehabilitation of existing facilities		
		2	Production capacity (m ³ /day)				NA	-	-	-	-	-							
		3	Production (m ³ /day)				74,278	-	-	-	-	-					A	27,111,344m ³ /y/365day	
		4	Utilization ratio of production capacity (%)		#DIV/0!	#DIV/0!	#VALUE!	-	-	-	-	-					A	No2/No3	
		5	Continuity of Service (Hrs/day)		24	24	24	→	NA	3	3	3		A	A	A		Excelent	
		6	Quality of water supplied (Compliance rate: %)		100	100	100	→	NA	4	4	4		A	A	A	All water samples meet water quality required guidelines/satandard	Excelent	
		7	Water supply pressure		enough	enough	enough	→	-	3	3	3		A	A	A	No designated low pressure area	very good	
		8	Leakage ratio (%)		1,047	979	1,169	↘	-	-	-	-		A	A	A	The indicator is breaks/year	It seems that there are a lot of aging pipes	
Business scale	2. Customer Increase and Trust	9	Population served				190,195		-	-	-	-					A		
			Active Connection				27,790		-	-	-	-					A		
		10	Service coverage / Water coverage (%)		87.9	90.5	90	→	NA	3	3	3		A	A	A		Not improved but good	
		11	Customer satisfaction (%)						NA	NA	NA	NA		A	A	A	-Data not available. -The five main complaints: 1.Connection Burst Pipe 2.No Water 3.Main Burst Pipe 4.Bill Dispute 5.Pressure Issue	Given the complaints from customers, ageing pipelines may be one of the major problems.	
		12	Water sold (m ³ /day)				38,473		-	-	-	-					A	14,042,792m ³ /y/365	
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#DIV/0!	#VALUE!	#VALUE!	202.3		-	-	-	-							
Cost-effectiveness	3. Water Tariff Profitability Improvement	14	Turnover from sales(WST)	29,031,552	32,079,073	29,297,861		→	-	-	-	-	C	C	C				
		15	Collection ratio (%)		67.86	69.03	78.73		↗	NA	2	2	2						Collection ratio is not so high but improving
		16	Non-revenue water ratio(%)		43.8	47.1	41.0		↗	NA	1	1	1		A	A	A	One of the causes is the aging infrastructure	NRW ratioseems to be the positive trend but the ratiois still high
		17	Metering ratio (%)		94.83	95.38	99.24		↗	NA	2	3	4		A	A	A		Greatly improved and it is considered to be a result of the efforts of water utility
		18	Water tariff level (USD/6M3)				US\$19.66		-	-	-	-					B	1-15m3:\$061/m3 14-40m3.\$1.34/m3 40< m3.\$1.74m3 Flat Rate:\$16/mon Revised periodically	
Prerequisites	4. Management and Financial Improvement	19	Accounting system	Corporate accounting	Corporate accounting	Corporate accounting		-	-	-	-	NA							
20		Net income (WST)	44,074	752,377	-1,133,435		→	-	-	-	-	C	C	C			Decreasing trend		
21		EBITDA (WST)	6,133,870	6,706,915	4,819,980		↘	-	-	-	-	C	C	C					
22		EBITDA margin (%)	27	28	23		→	2	2	2	NA	C	C	C					
23		EBITDA margin excl. deferred income (%)	4	-1	-10		↘	2	1	1	NA	C	C	C			EBITDA excluding subsidy is negative. It is dependent on subsidy		
24		Total capital operating margin (%)	0	1	-0		→	-	-	-	-	C	C	C					
25		Operating Profit Margin(%)	0	2	-4		↘	2	2	1	NA	C	C	C					
Financial soundness		26	Equity ratio (%)	33	32	31		↘	2	2	2	NA	C	C	C				
		27	Fixed long term conformity rate (%)	89	86	85		↘	3	3	3	NA	C	C	C				
		28	O&M cost coverage ratio (%)	122	123	115		↘	2	2	2	NA	C	C	C				
		29	O&M cost coverage ratio excluding subsidies (%)	99	96	87		↘	1	1	1	NA	C	C	C			This is less that 100%. This is a concern	
		30	Unit cost of water supply (WST/m ³) (Overall cost including DEP/Water sold)	#DIV/0!	#DIV/0!	#DIV/0!	0	-	-	-	-	-							
		31	Supply price (WST/m ³) (Turnover from sales/ Water sold)	#DIV/0!	#DIV/0!	#DIV/0!	0	-	-	-	-	-							
			Overall cost excluding depreciation expense	22,872,371	25,369,847	24,477,881		→	-	-	-	-	C	C	C				
			Overall cost including depreciation expense	28,430,884	30,812,618	29,912,653		→	-	-	-	-	C	C	C				
		32	Subsidies (WST)	5,204,277	6,874,361	6,920,474		↗	-	-	-	-	C	C	C				
		33	Development Partner grant support (WST)	0	0	0		-	-	-	-	-	C	C	C				
		34	The ratio of subsidies and DP support to turnover	23	28	33		↗	-	-	-	-	C	C	C				
		HR efficiency	35	Number of staff per 1,000 connections		9	9	9.85	→	NA	2	2	2		A	A	A		Very high. O&M does not seem to be efficient and has some challenges.

2. Analysis based on financial statements (FS analysis)

Summary

The most recent data is on the financial year ending June 2022. Thus the financial situation might have changed. SWA has slight plus/minus net income during the four years from 2018/2019. The grants accounts for 17% of the total income and the amount is more less stable for four years. This receives significant portion of government grant for capital investment. Further, O&M cost is not fully covered by the tariff revenue. SWA invests in fixed asset more than annual depreciation, which is positive in terms of expanding the infrastructure, although this investment activities is supported by the government grant.

Positive

SWA had positive net income until 2021. SWA invest in fixed asset more than its annual depreciation.

Negative

The net income decreased and became negative in 2022. This is because of 10% decrease of turnover in 2022. Further O&M cost coverage is not beyond 100% excluding the subsidy. This means O&M cost is not fully covered by the tariff revenue. Further, Personal cost accounts for 40% of operation cost, which is relatively high.

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	Corporate accounting
	Comments by auditor	-
2	P/L	
	Profitability	SWA had slightly positive net income until 2021, but became negative in 2022. This is because of 10% decrease of turnover in 2022. O&M cost coverage is less than 100% excluding the subsidy. This means O&M cost is not covered by the tariff revenue. Further SWA is supported by grants.
	Revenues Composition	Water sales accounts for 65% of its revenue, 17% grant, 7% wastewater and the remaining others. This means the main business is water sales but relies on government subsidy.
	Subsidy details and trends	Around 17% of its revenue is subsidy. The main portion is for capital investment.
	Expenses Composition	40% is Personal cost and 33% by Operations and maintenance costs, 18% depreciation cost, 9% administration cost. This means personnel cost accounts for the main portion of the cost.
3	B/S	
	Financing	SWA has accumulated loss, which is stable over the period. Further, deferred income, which is mainly government grant, accounts for 67%. Further, there is no long-term borrowings in the B/S. This means that SWA's main source for capital investment is government grant.
	Fixed Assets	Fixed asset accounts for 83% of the total asset. The PPE has been gradually increasing because of its investments.
	Accounts Receivable	Receivables is equivalent to 3 months of its water revenue and slightly increasing due to limited collection ratio.
	Related party payables	Payables are very small portion and not increasing, which seems no problem.
4	C/F	
	Trends	Net operating cashflow is slight plus/minus depending the year. "Purchase of fixed assets" is beyond the annual depreciation, which means SWA is increasingly investing the fixed asset. Therefore, the free cash flow is minus. This investment activities is supported by the government grant.

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

SWA provides a good level of water supply services, including continuity, quality, pressure, and service coverage. The spiral 1 to 2 is working, though customer satisfaction needs to be verified. However, the NRW ratio is high and increasing, while the collection ratio remains relatively low—both key factors contributing to insufficient revenue turnover. Additionally, the tariff level should be assessed. The spiral 2 to 3 is not working well, and the overall financial condition is weak, indicating that the spiral 3 to 4 is also not working well. O&M cost coverage is less than 100% excluding the subsidy. Although the infrastructure investments are being made, SWA remains heavily dependent on government grants, highlighting a lack of financial self-sufficiency. To place SWA on a sustainable growth spiral, the improvements in the NRW ratio and collection efficiency, along with an appropriate tariff level (subject to further evaluation), are essential. Furthermore, the uncertainty surrounding production capacity could impact future service reliability.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?	
Diagnosis result	The level of water supply services (continuity of service, water quality, water pressure, and service coverage) is good and the service coverage is good (90%). The growth spiral is working but the increase of population served and customer satisfaction is to be confirmed. The number of broken pipes is increasing and the main cause is considered to be aged pipes. Pipe breaks are a major customer complaint. So, the NRW ratio would continue to increase in the future. Replacement of aged pipes is considered a high priority to improve water service. According to the response to the questionnaire, it is not confirmed whether the production capacity is sufficient or not.
Required detailed diagnosis	Need to confirm whether the production capacity is sufficient to meet future population growth and increase of population served. Need to confirm customer satisfaction. Need to pay attention to the increasing number of pipe breaks (the progress of aged pipes replacement).

KPI #	KPI	Data (2023)	Stage of growth	Trend
1	Investment cost (WST)	6,260,474	-	↘
2	Production capacity (m/day)	NA	-	-
3	Production (m/day)	74,278	-	-
4	Utilization ratio of production capacity (%)	#VALUE!	-	-
5	Continuity of Service (Hrs/day)	24	3	→
6	Quality of water supplied (Compliance rate: %)	100	4	→
7	Water supply pressure	enough	3	→
8	Leakage ratio (%)	1,169	-	↘

Investment cost is in 2022.

(4→1) Is the financial improvement leading to investment activities?	
Diagnosis result	SWA invest in fixed asset more than annual depreciation, which is positive in terms of expanding the infrastructure. However, this investment activities is supported by the government grant. This indicates SWA does not self-finance the investment. The reliance on subsidy is due to negative financial conditions.
Required detailed diagnosis	Investment cost is in a reducing trend and it needs to check if the future capacity of water supply system including production capacity is sufficient or not.

Legend	Note:
○ Working well	The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.
○ Working	
△ Not working well	

KPI #	KPI	Data (2023)	Stage of growth	Trend
9	Population served	190,195	-	0
10	Service coverage / Water coverage (%)	90	3	→
11	Customer satisfaction (%)	-	NA	0
12	Water sold (m/day)	38,473	-	0
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	202	-	0

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?	
Diagnosis result	The turnover is not increasing and the collection ratio is relatively low. The growth spiral is not working well. In addition, the NRW ratio is high, which leads to a reduction in turnover. The water metering ratio is 100%.
Required detailed diagnosis	Need to confirm causes of high NRW. Need to confirm causes of relatively low collection ratio.

KPI #	KPI	Data (2023)	Stage of growth	Trend
14	Turnover from sales(WST)	29,297,861	-	→
15	Collection ratio (%)	79	2	↗
16	Non-revenue water ratio(%)	41	1	↗
17	Metering ratio (%)	99	4	↗
18	Water tariff level (USD/6M3)	19.66	-	0

Turnover is in 2022.

KPI #	KPI	Data (2022)	Stage of growth	Trend
19	Accounting system	Corporate accounting	-	-
20	Net income (WST)	-1,133,435	-	→
21	EBITDA (WST)	4,819,980	-	↘
22	EBITDA margin (%)	23	2	→
23	EBITDA margin excl. deferred income (%)	-10	1	↘
24	Total capital operating margin (%)	-0	-	→
25	Operating Profit Margin(%)	-4	1	↘
26	Equity ratio (%)	31	2	↘
27	Fixed long term conformity rate (%)	85	3	↘
28	O&M cost coverage ratio (%)	115	2	↘
29	O&M cost coverage ratio excluding subsidies (%)	87	1	↘
30	Unit cost of water supply (WST/m³) (Overall cost including DEP/Water sold)	#DIV/0!	-	-
31	Supply price (WST/m³) (Turnover from sales/ Water sold)	#DIV/0!	-	-
32	Subsidies (WST)	6,920,474	-	↗
33	Development Partner grant support (WST)	0	-	-
34	The ratio of subsidies and DP support to turnover	33	-	↗
35	Number of staff per 1,000 connections	9	2	→

(3→4) Is the tariff revenue improvement leading to financial improvement?	
Diagnosis result	The overall financial condition is not well. The net income is negative, which leads to negative EBITDA margin excl. deferred income. The O&M cost coverage is less than 100%, which indicates O&M cost is not covered by the tariff revenue. Further, SWA has accumulated loss in B/S.
Required detailed diagnosis	It needs to check tariff level. The personal cost accounts for 40% of operation cost, which is relatively high and the number of staff per 1,000 connections is high. It needs to check if these are reasonable values for operating activities.

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic Report -

Dhaka Water Supply and Sewerage Authority (DWASA)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (BDT)	–	–	–	–
		2	Production capacity (m ³ /day)	–	–	–	–
		3	Production (m ³ /day)	–	–	–	–
		4	Utilization ratio of production capacity (%)	–	–	–	–
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	–
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	–
		8	Leakage ratio (%)	–	–	–	–
Business scale	2. Increased customer base and satisfaction	9	Population served / connections	–	–	–	–
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	–
		12	Water sold (m ³ /day)	–	–	–	–
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	–	–	–	–
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(BDT)	–	–	–	–
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%(15-25%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	–	–	Aim for a level of sustainable investment	–
Prerequisites	4. Improved financial management	19	Accounting system	–	–	Accrual basis	–
20		Net income (BDT)	–	–	–	–	
Profitability		21	EBITDA (BDT)	–	–	–	–
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	–
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	–
		24	Total capital operating margin (%)	–	–	–	–
		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	–
Financial soundness		26	Equity ratio (%)	–	Less than 40%	Aim for 40% or more	–
		27	Fixed long term conformity rate (%)	–	Above 100%	Aim for less 100%	–
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	–
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (BDT/m ³) (Overall cost including DEP/Water sold)	–	–	–	–
		31	Supply price (BDT/m ³) (Turnover from sales/ Water sold)	–	–	–	–
			Overall cost excluding depreciation expense	–	–	–	–
			Overall cost including depreciation expense	–	–	–	–
		32	Subsidies (BDT)	–	–	–	–
		33	Development Partner grant support (BDT)	–	–	–	–
		The ratio of subsidies and DP support to turnover	–	–	–	–	
Human resource efficiency		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the "Africa Executive Forum Utility Profile" appears to be "operating revenues/operation and maintenance expenses," we added "operating revenues from water services/operation and maintenance expenses" so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

Unit: Tousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: DWASA			Improve ment	Source				Remarks (Additional information)	Initial diagnosis by indicator
				2020/21	2021/22	2022/23		2020/21	2021/22	2022/23	2023/24		
Service level	1. Service Improvement and Investment Activities	1	Investment cost (BDT)		41,180,613	29,878,023	↘				B		
		2	Production capacity (m ³ /day)			2,750,000							
		3	Production (m ³ /day)	2,590,000	2,650,000	2,680,000	→	B	B	A		Ground water 655349 ML 67%, Surface water 322806 ML 33% *A	Increasing gradually Ground water is major source.
		4	Utilization ratio of production capacity (%)			97							Almost 100%
		5	Continuity of Service (Hrs/day)	24	24	24	→	A	A	A			Good
		6	Quality of water supplied (Compliance rate: %)	90.28	89.16	91.48	→	A	A	A			Good
		7	Water supply pressure	1bar	1bar	1bar	→						Good
		8	Leakage ratio (%)		380	320.0	→					Unit is breaks/year	The number of break is decreasing.
Business scale	2. Customer Increase and Trust	9	Population served			22,000,000					A		
			Active Connection			387,366					A		
		10	Service coverage / Water coverage (%)	100.0	100.0	100.0	→	A	A	A			Good
		11	Customer satisfaction (%)	High	High	High	→	A	A	A		-DWASA has a complain resolve redressal system. Through that all the complain is resolved, If required survey is conducted. Percentage of complaints resolves - 100% -Five main complaints: 1. Pipe leakage 2. Water trolley demand 3. Customer complaint regarding bill amount 4. Water is not reaching the remote end of the service line 5.Water scarcity complaint from areas affected by pump repair and maintenance	Customer complaints are dealt with accordingly. It is understood that the main complaints were related to ageing pipes and water pressure.
		12	Water sold (m ³ /day)			2,139,642.9						1.2 8	
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#DIV/0!	#DIV/0!	97.3							
Cost-effectiveness	3. Water Tariff Profitability Improvement	14	Turnover from sales(BDT)	17,531,673.62	19374075.36	25,562,124.91	↗	A	A	A		2.1 H	Increasing trend by 10%
		15	Collection ratio (%)	100	100	99.98	→	A	A	A		2.1 H	Good
		16	Non-revenue water ratio(%)	18	18	18	→	A	A	A		Less than 18% (2.1 E) Non-Revenue Water "Below 10% in DMA""Non-DMA service area is below 18%" (3.1 OS1.3)	DMAs have been set and NRW measures appear to be being implemented.
		17	Metering ratio (%)	98.0	98.0	98.0	→	A	A	A			Good
Prerequisites	4. Management and Financial Improvement	18	Water tariff level (USD/6M3)	0.73	0.77	0.77	→	B	B	B		DWASA is permitted to increase its tariff by up to 5% annuary. Currently, inflation has consistently exceeded more than 5% and tariff level also has been increased more than 5%. These adjustments, which range from 20% to 30%, have been made with the approval of the Local Government Division of the Bangladesh Government, based on the prevailing economic conditions and financial requirements of the organization. (2.2 H.2) See Calculation table below this table	
		19	Accounting system	Corporate	Corporate	Corporate		A	A	A		3.4 F4	
		20	Net income (BDT)	17,531,674	-3,789,847	-5,258,669	↘	A	A	A		2.1 H	The deficit has been increasing
		21	EBITDA (BDT)		9,565,760	9,606,030	→		C	C			
		22	EBITDA margin (%)		54	50	↘		C	C			EBITDA margin is quite high
		23	EBITDA margin excl. deferred income (%)		54	30	↘		C	C			
		24	Total capital operating margin (%)		2	2	→		C	C			
		25	Operating Profit Margin(%)		-18	-16	↘		C	C			
		26	Equity ratio (%)		12	28			C	C			
		27	Fixed long term conformity rate (%)		92	94	→		C	C			Stable financing
		28	O&M cost coverage ratio (%)	174	196	212	→	A	C	C		-Operation cost coverage (%) is minimum 0.66 (22-23) (3.1 OS1.3 -)	O&M cost coverage ratio is very high.
		29	O&M cost coverage ratio excluding subsidies (%)		196	177	↘		C	C			
		30	Unit cost of water supply (BDT/m ³) (Overall cost including DEP/Water sold)	#DIV/0!	#DIV/0!	18			A			-Operating costs of water service fully covered by revenue from water service (2.2 I.1) -The cost of treating 1,000 liters of water is approximately 30 taka, while the current domestic water tariff is around 16 taka per 1,000 liters. This creates a significant deficit, as the tariff does not fully cover the production and treatment costs. To ensure sustainability and cost recovery, there is a pressing need to revise the tariff rates in accordance with the actual production costs.(2.2 I.2)	O&M cost coverage ratio is very high. According to the remarks, the cost of water treatment is about double the current water tariff. And DWASA is considering the need to increase the current water tariff level. There seems to be a contradiction in the questionnaire answer.
		31	Supply price (BDT/m ³) (Turnover from sales/ Water sold)	#DIV/0!	#DIV/0!	33			A				
			Overall cost excluding depreciation expense		9,069,014	10,902,786	→		C	C			
			Overall cost including depreciation expense		13,213,221	14,033,153	→		C	C			
Financial soundness		32	Subsidies (BDT)		0	3,847,291			C	C			
		33	Development Partner grant support (BDT)		0	0			C	C			
		34	The ratio of subsidies and DP support to turnover		0.0	19.9			C	C			
HR efficiency		35	Number of staff per 1,000 connections	14	14	14	→		A			-Dhaka's dense population makes operation and maintenance (O&M) activities challenging, with coordination among multiple stakeholders often causing delays. Another problem is Very low return for O&M activity.(3.3 OP2.2)	Very high, Dhaka's dense population is seen as one of the biggest challenges for O&M.

2. Analysis based on financial statements (FS analysis)

Summary

DWASA's financial performance is very high with its O&M cost coverage ratio excluding subsidies in 2022-2023 is 177%. DWASA make capital expenditure more than its depreciation cost. This investments is mainly financed through borrowing loans from development partners for the investment. However, the exchange losses, recorded as non-operating expenses, caused deficits for the last 2 years. The exchange loss in FY2022/2022 accounted for 50% of the service delivery earnings.

Positive

DWASA's O&M cost coverage ratio excluding subsidies is respectively 177% in FY2022-2023 and 199% in FY2021-2022. and they borrow loans from development partners for infrastructure investment

Negative

DWASA marked significant exchange loss, which caused the negative net profit in 2022-23. This further made DWASA have accumulated loss in their B/S. DWASA receives grants. A certain level of grant funding is reasonable, as DWASA operates sewerage services, which are not financially lucrative.

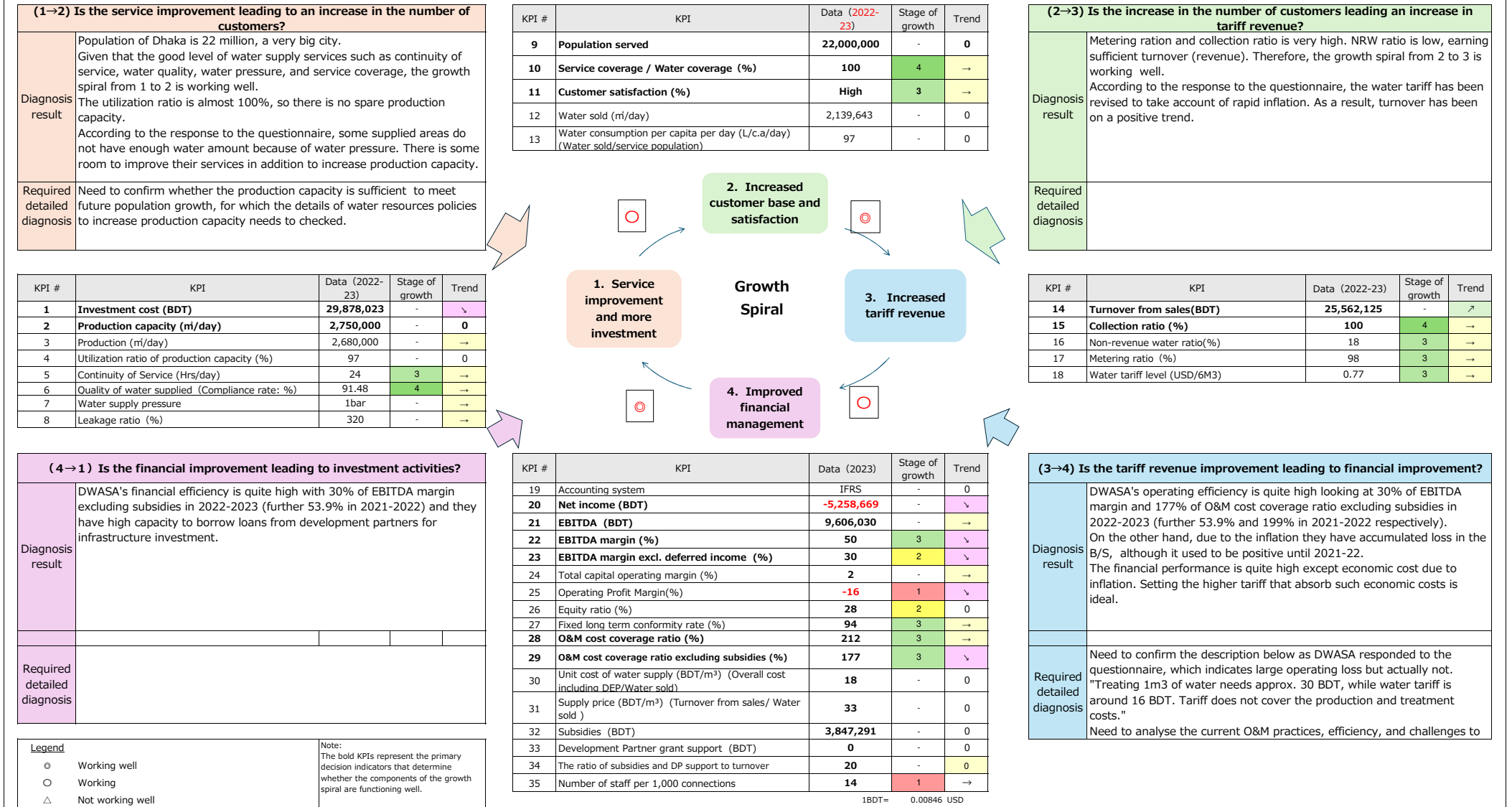
Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	The auditor noted the financial statement follows International Financial Reporting Standards (IFRSs), the Water Supply and Sewerage Authority Act, 1996 and other applicable laws and regulations.
	Comments by auditor	- The auditor noted the valuation of PPE as key audit matter because it involves significant management judgement and estimation.
2	P/L	
	Profitability	While DWASA's operating profit is positive for the last 2 years, the exchange losses, recorded as non-operating expenses, caused deficits for the last 2 years. The exchange loss in FY2022/2022 accounted for 50% of the service delivery earnings. As a result of this consecutive negative profit, DWASA now has accumulated loss in the B/S. EBITDA margin and O&M coverage ratio have been positive.
	Revenues Composition	The water sales accounts for 75% of its revenue, and wastewater 25%, which indicates the main business is water sales.
	Subsidy details and trends	DWASA receives grants, accounting for 22% of its revenue. It is increasing trend.
	Expenses Composition	38% is production cost (mainly electricity), 22% depreciation cost, 18% personnel costs, 17% operation and maintenance cost, 4% administration cost, which indicates production cost (mainly electricity), accounts for the main portion of the cost.
3	B/S	
	Financing	In terms of the capital investment, DWASA finance through grant and borrowings. This is mainly from international donors/banks and the main source of capital investment. This might be for the sanitation operations, which is not financially lucrative.
	Fixed Assets	Fixed assets account for 53% of total assets, which falls within the typical range for average water utilities. Property, Plant and Equipment (PPE) and Intangible Assets of DWASA was revaluated. Thus the revaluation loss is recorded
	Accounts Receivable	Accumulated receivables are equivalent to four months of total revenue. The impairment allowance is calculated 5% on receivables against gross services delivery earning. This might not reflect the potential loss.
	Related party payables	Payables are very small portion and not increasing, which seems no problem.
4	C/F	
	Trends	DWASA's operating cash flow is positive. Further, DWASA has been investing in property, plant and equipment more than depreciation expenses. In terms of cashflow from financial activities, DWASA received loans from international donors/banks with some annual repayment.

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

DWASA serves a large population of 22 million in Dhaka with high service continuity, water quality, pressure, and coverage. The utilization ratio of production capacity is nearly 100%, indicating no spare production capacity. The NRW ratio is as low as 18%, contributing to good revenue. The water tariff has been adjusted for inflation, leading to positive turnover trends. Financially, DWASA shows high operating efficiency with a 30% EBITDA margin and 177% O&M cost coverage ratio in 2022-2023. However, the exchange losses, recorded as non-operating expenses, caused deficits for the last 2 years. Despite accumulated losses, financial performance remains robust, supported by loans from development partners for infrastructure investment. However, the number of staff per 1,000 connections remains high, suggesting room for improvement in staff efficiency. Improving this aspect could further enhance operational effectiveness and financial stability.

Growth spiral diagnostics



Growth Spiral

Legend

- Working well
- Working
- △ Not working well

Note:
The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic Report -

Rajshahi Water Supply and Sewerage Authority (RWASA)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)

in association with

Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

0. Benchmarks

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. GS diag (Diagnosis based on growth spiral)

0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (BDT)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(BDT)				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25% (15-20%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Accrual basis	—
Profitability		20	Net income (BDT)	—	—	—	—
		21	EBITDA (BDT)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	—
		26	Equity ratio (%)	—	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (BDT/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (BDT/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (BDT)	—	—	—	—
		33	Development Partner grant support (BDT)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
	Human resource efficiency	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the “Africa Executive Forum Utility Profile” appears to be “operating revenues/operation and maintenance expenses,” we added “operating revenues from water services/operation and maintenance expenses” so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

Unit: Thousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: RWASA				Improve ment	Stage of growth				Source				Remarks (Additional information)	Initial diagnosis by indicator
				2020	2021	2022	2023		2020	2021	2022	2023	2020	2021	2022	2023		
Service level	1. Service Improvement and Investment Activities	1	Investment cost (BDT)		238,868,587	345,838,941			-	-	-	-		C	C		the priority areas for capital investment in the next 3 years ☑ Water treatment plants ☑ Network expansion ☑ Rehabilitation of existing facilities *A	It appears that the production capacity of WTPs is not sufficient, so continuity of service have not increased yet.
		2	Production capacity (m³/day)				107,040		-	-	-	-				A		
		3	Production (m³/day)		83,664	87,011	107,040	↗	-	-	-	-		B	B	A	ground water 91.6%, surface water 8.4%*A The supplied amount is almost half of the water demand for 2021 and 2022. *B	The amount of production is increasing, but the supplied amount is very limited compared to the water demand.
		4	Utilization ratio of production capacity (%)		#DIV/0!	#DIV/0!	100%		-	-	-	-					Not sure at the moment.	
		5	Continuity of Service (Hrs/day)		12	12	12	→	NA	2	2	2		A	A	A		Remain unchanged
		6	Quality of water supplied (Compliance rate: %)		79.60	85.29	80.52	→	NA	2	3	3		A	A	A		
		7	Water supply pressure		1.7bar	1.8bar	2bar		-	-	-	-		A	A	A	The water pressure is very high and there appear to be mountain areas. The leakage rate is also likely to be very high if there are many ageing pipes.	It is considered that these customer complaints are related to the high water pressure.
		8	Leakage ratio (%)						-	-	-	-					Pipe leakage and pipe break are the largest main complaints *A	
Business scale	2. Customer Increase and Trust	9	Population served				564,000		-	-	-	-				A		
			Active Connection				51,124		-	-	-	-				A		
		10	Service coverage / Water coverage (%)		83.60	86.83	87.58	↗	NA	3	3	3		A	A	A		Slightly improving
		11	Customer satisfaction (%)						NA	NA	NA	NA						
		12	Water sold (m³/day)				75,490		-	-	-	-						
Cost-effectiveness	3. Water Tariff Profitability Improvement	13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#DIV/0!	#DIV/0!	#DIV/0!	133.8		-	-	-	-						
		14	Turnover from sales(BDT)		407,714,056	669,901,173			-	-	-	-		C	C			
		15	Collection ratio (%)		43	62	67	↗	NA	1	2	2		A	A	A	RWASA has plans to improve the collection ratio such as ensuring timely dispatch of water bills to customers *A	Very low. The low collection rate results in a lack of turnover.
		16	Non-revenue water ratio(%)		26.7	29.5	29.5	→	NA	2	2	2						It appears that the NRW rate increases in proportion to the water pressure.
		17	Metering ratio (%)						NA	NA	NA	NA					The metering system is currently unavailable under RWASA *A	Unavailability of the metering system may result in no improvement in the NRW and RWASA may not be able to collect appropriate charges from customers.
		18	Water tariff level (USD/6M3)						-	-	-	-						
Prerequisites	Profitability	19	Accounting system		Corporate Accounting	Corporate Accounting			NA	-	-	NA						
		20	Net income (BDT)		189,811,441	350,623,619		↗	-	-	-	-		C	C			Almost doubled from 2021 to 2022
		21	EBITDA (BDT)		210,389,478	391,543,873		↗	-	-	-	-		C	C			
		22	EBITDA margin (%)		337	608		↗	NA	3	3	NA		C	C			EBITDA margin is too high.
		23	EBITDA margin excl. deferred income (%)		-172	-295		↘	NA	1	1	NA		C	C			The subsidy is significant amount, so EBITDA margin excluding subsidy is minus
		24	Total capital operating margin (%)		15	20		↗	-	-	-	-		C	C			
		25	Operating Profit Margin(%)		47	52		↗	NA	3	3	NA		C	C			
		26	Equity ratio (%)		99	98		→	NA	3	3	NA		C	C			
		27	Fixed long term conformity rate (%)		59	60		↗	NA	3	3	NA		C	C			
		28	O&M cost coverage ratio (%)		193	232		↗	NA	3	3	NA		C	C			
Financial soundness	4. Management and Financial Improvement	29	O&M cost coverage ratio excluding subsidies (%)		32	23	77.9	↗	NA	1	1	1		A	A	A	Not fully covered because of the following factors: 1. Large Operation and maintenance cost. (Example: Repairing of pipe leakage, Repairing of motor, Expense of Electricity Bill, Fuel Bill.) 2. Current water tariff rate. *A	Only around 20% of the OM cost is covered by tariff revenue
		30	Unit cost of water supply (BDT/m³) (Overall cost including DEP/Water sold)	#DIV/0!	#DIV/0!	#DIV/0!	0		-	-	-	-						
		31	Supply price (BDT/m³) (Turnover from sales/ Water sold)	#DIV/0!	#DIV/0!	#DIV/0!	0		-	-	-	-						
			Overall cost excluding depreciation expense		197,324,578	278,357,300		↗	-	-	-	-		C	C			
			Overall cost including depreciation expense		217,902,615	319,277,554		↗	-	-	-	-		C	C			
		32	Subsidies (BDT)		317,888,920	581,519,459		↗	-	-	-	-		C	C			
		33	Development Partner grant support (BDT)		0	0			-	-	-	-		C	C			
		34	The ratio of subsidies and DP support to turnover		508.7	902.8		↗	-	-	-	-		C	C			
		35	Number of staff per 1,000 connections		5.91	5.65	5.49	↗	NA	3	3	3		A	A	A	RWASA has taken an initiative of pump automation activities of all the pumps.*A Lack of human resources: the utility cannot afford to hire personnel due to lack of financial resources.*A	RWASA is trying to increase the efficiency of O&M, but at the same time suffers from a shortage of human resources.

2. Analysis based on financial statements (FS analysis)

Summary

Because the latest financial information is for financial year ending June 2022, it should be noted the financial situation might have change. RWASA actively invest in infrastructure expansion by utilizing the government subsidy. However 'RWAS is highly dependent on Donation Received from Government and therefore, O&M cost coverage ratio excluding subsidies is only 20%, which means the OM cost is not covered by tariff revenue.

Positive

RWASA invest in the acquisition of fixed asset 10 times more than annual depreciation. This is supported by the governmental donation.

Negative

RWAS is highly dependent on Donation Received from Government, which accounts for 87% of the total annual income. Therefore, O&M cost coverage ratio excluding subsidies is only 20%, which means the OM cost is not covered by tariff revenue.

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	Corporate accounting
	Comments by auditor	-
2	P/L	
	Profitability	RWASA's operating profit is positive during the 2 years. However, Donation Received from Government accounts for 87% of the total annual income. This indicates that a significant dependency to the donation. Further this amount increased by 83% from 2021 to 2022. Therefore, the O&M cost coverage ratio excluding subsidies is as low as 20%.
	Revenues Composition	Water sales accounts for 10% of the total revenue, 87% Donation Received from Government.
	Subsidy details and trends	Donation Received from Government accounts for 87% of the total annual income, this is increasing trend.
	Expenses Composition	38% is Production overhead (Including Operations & Maintenance and a half is electricity), 31% personnel cost, 13% depreciation cost, 9% Administrative expenses. This means that Production overhead (Including Operations & Maintenance and a half is electricity) accounts for the main portion of the cost.
3	B/S	
	Financing	69% of the total asset is retained earnings and this is significantly increasing. Therefore, the equity ratio is 98%. However, this is the result of annual surplus (net profit) that originally comes from Donation Received from Government.
	Fixed Assets	Fixed asset accounts for 59% of the total asset, which is not far from average water utilities.
	Accounts Receivable	Accumulated receivables are equivalent to 13 months of the total revenue, which suddenly appears in 2021-2022. The reason for this needs to be checked.
	Related party payables	There is a small portion of VAT payables, which is on increasing trend.
4	C/F	
	Trends	RWASA invests in the acquisition of fixed asset 10 times more than annual depreciation. This cash comes from Donation Received from Government.

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

RWASA faces several critical challenges. Its high water pressure causes frequent pipe leaks and breaks, leading to customer complaints. Despite its increased service coverage, the utility's growth is ineffective. The collection ratio is improving but remains low. The lack of a metering system hinders accurate NRW management and proper billing. Its O&M cost coverage ratio excluding subsidies is only 20%, resulting in poor financial situation. Therefore, RWASA heavily relies on government subsidies.

Infrastructure investments depend on these subsidies, indicating a lack of financial self-sustainability. The utility invests in infrastructure at a rate 10 times higher than annual depreciation, funded entirely by government donations. Significant improvements in financial management, metering, and infrastructure maintenance are needed for sustainability.

Growth spiral diagnostics

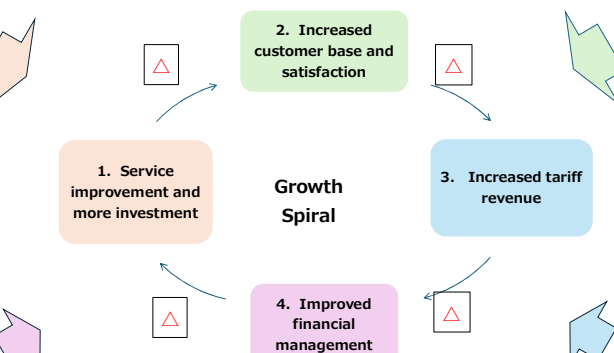
(1→2) Is the service improvement leading to an increase in the number of customers?	
Diagnosis result	Because the production capacity and production volume are same, there seems to be no room to increase the production capacity anymore, so the continuity of service will not be improved. The water pressure is very high and the main complaints from customers are pipe leaks and pipe breaks. It is considered that these complaints are related to the high water pressure. Although the service coverage has been increasing, the growth spiral is not working well.
Required detailed diagnosis	Need to analyse the utilization ratio of production capacity and causes of no improvement of the continuity of service. Need to analyse causes of high water pressure.

KPI #	KPI	Data (2023)	Stage of growth	Trend
1	Investment cost (BDT)	0	-	0
2	Production capacity (m/day)	107,040	-	0
3	Production (m/day)	107040	-	↗
4	Utilization ratio of production capacity (%)	1	-	0
5	Continuity of Service (Hrs/day)	12	2	→
6	Quality of water supplied (Compliance rate: %)	81	3	→
7	Water supply pressure	2bar	-	0
8	Leakage ratio (%)	0	-	0

(4→1) Is the financial improvement leading to investment activities?	
Diagnosis result	RWASA invests in infrastructure development 10 times more than its annual depreciation. However, this entirely comes from Donation Received from Government. Therefore, the growth spiral is not working well independently.
Required detailed diagnosis	

Legend	Note:
○ Working well	The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.
○ Working	
△ Not working well	

KPI #	KPI	Data (2023)	Stage of growth	Trend
9	Population served	564,000	-	0
10	Service coverage / Water coverage (%)	88	3	↗
11	Customer satisfaction (%)	0	NA	0
12	Water sold (m/day)	75,490	-	0
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	134	-	0



KPI #	KPI	Data (2022)	Stage of growth	Trend
19	Accounting system	IFRS	-	0
20	Net income (BDT)	350,623,619	-	↗
21	EBITDA (BDT)	391,543,873	-	↗
22	EBITDA margin (%)	608	3	↗
23	EBITDA margin excl. deferred income (%)	-295	1	↘
24	Total capital operating margin (%)	20	-	↗
25	Operating Profit Margin(%)	52	3	↗
26	Equity ratio (%)	98	3	→
27	Fixed long term conformity rate (%)	60	3	↗
28	O&M cost coverage ratio (%)	232	3	↗
29	O&M cost coverage ratio excluding subsidies (%)	23	1	↘
30	Unit cost of water supply (BDT/m ³) (Overall cost including O&P/Water sold)	#DIV/0!	-	0
31	Supply price (BDT/m ³) (turnover from sales/ water sold)	#DIV/0!	-	0
32	Subsidies (BDT)	581,519,459	-	↗
33	Development Partner grant support (BDT)	0	-	0
34	The ratio of subsidies and DP support to turnover	903	-	↗
35	Number of staff per 1,000 connections	6	3	↗

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?	
Diagnosis result	The collection ratio has improved, but it is still very low. The low collection rate seems not to be leading to sufficient turnover. Unavailability of the metering system may result in no improvement in the NRW and RWASA may not be able to collect appropriate charges based on water usage from customers. According to the response to the questionnaire, the level of water tariff is considered low to cover the current O&M costs. Low collection ratio, current water tariff level and high NRW seem to lead to poor financial situation. Therefore, the working spiral is not working well.
Required detailed diagnosis	Need to analyse causes of low collection ratio. Need to analyse causes of high NRW and whether there is room for improvement in the measures against NRW being conducted by RWASA.

KPI #	KPI	Data (2023)	Stage of growth	Trend
14	Turnover from sales(BDT)	0	-	0
15	Collection ratio (%)	67	2	↗
16	Non-revenue water ratio(%)	29	2	→
17	Metering ratio (%)	0	NA	0
18	Water tariff level (USD/6M3)	0	-	0

(3→4) Is the tariff revenue improvement leading to financial improvement?	
Diagnosis result	Its O&M cost coverage ratio excluding subsidies is only 20%, tariff-cost balance need to be checked. Although RWASA accumulates retained earnings thanks to the government subsidy. If it is excluded, the annual surplus would not happen. Therefore, the growth spiral is not working well.
Required detailed diagnosis	

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic Report -

Water and Sanitation Agency, Lahore (WASA-L)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

- 0. Benchmarks
- 1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
- 2. FS analysis (Analysis based on financial statements)
- 3. GS diag (Diagnosis based on growth spiral)

0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (PKR)	—	—	—	—
		2	Production capacity (m/day)	—	—	—	—
		3	Production (m/day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections	—	—	—	—
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m/day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(PKR)	—	—	—	—
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25% (15-25%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Accrual basis	—
Profitability		20	Net income (PKR)	—	—	—	—
		21	EBITDA (PKR)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	—
		26	Equity ratio (%)	—	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (PKR/m³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (PKR/m³) (Turnover from sales / Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (PKR)	—	—	—	—
33		Development Partner grant support (PKR)	—	—	—	—	
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
Human resource efficiency		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the "Africa Executive Forum Utility Profile" appears to be "operating revenues/operation and maintenance expenses," we added "operating revenues from water services/operation and maintenance expenses" so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

Utility name: WASA-L																	Unit: local currency	
Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	KPI Values				Improve ment	Stage of growth				Source				Remarks (Additional information)	Initial diagnosis by indicator
				2020	2021	2022	2023		2020	2021	2022	2023	2020	2021	2022	2023		
Service level	1. Service Improvement and Investment Activities	1	Investment cost (PKR)	-	-	-	-	-	-	-	-	-	-	-	-	No information available, the priority areas for capital investment in the next 3 years: ❑ Water resource development ❑ Water treatment plants ❑ Rehabilitation of existing facilities		
		2	Production capacity (m ³ /day)				1,636,592	-	-	-	-				A	359 MGD= 697,356,080 m3/year		
		3	Production (m ³ /day)				1,459,294	-	-	-	-				A	321MGD= 532,642,310 m3/year only ground water		
		4	Utilization ratio of production capacity (%)				89	-	-	-	-				A		Existing WTP production capacity does not have sufficient room for further production expansion.	
		5	Continuity of Service (Hrs/day)	11	11	11	→	NA	1	1	1		A	A	A	-Summer : 14, Winter : 8, Average: 11 (2023) -Currently relying on Ground water, and continuous extraction was leading towards declination in water table. As water conservation practice, now water is being supplied on intermittent basis.	Continuity of service is very limited and have not been improved.	
		6	Quality of water supplied (Compliance rate: %)	99.8	99.5	98.3	→	NA	4	4	4		A	A	A	The number of drinking water samples that meet the required guidelines and standards as a percentage of the total number of drinking water samples.	Water quality is very good	
		7	Water supply pressure	1~3m	1~3m	1~3m	→	-	1	1	1		A	A	A	The approximate percentage of the customers in low water pressure area 20%	Water pressure is low and residents may not have access to adequate water supply.	
		8	Leakage ratio (%)	18,682	24,330	26,510	↘	-	-	-	-		A	A	A	The indicator is breaks/year.	Increasing leakage ratio appears to indicate that pipelines are aging more and more and effective mesures are not being implemented	
Business scale	2. Customer Increase and Trust	9	Population served				8,700,000	-	-	-	-							
			Active Connection				806,460	-	-	-	-							
		10	Service coverage / Water coverage (%)	100.0	100.0	100.0	→	NA	4	4	4						very good	
		11	Customer satisfaction (%)					NA	NA	NA	NA					The responded ratio to total complaints is about 90%. Three main complaints are: 1.Sewerage blockage 2.Water shortage 3.Water leakage	Customer complaints have been responded but customer satisfaction is unknown.	
		12	Water sold (m ³ /day)	-	-	-	-	-	-	-	-							
Cost-effectiveness	3. Water Tariff Profitability Improvement	13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	-	-	-	-							
		14	Turnover from sales(PKR)		6,608,702,145	7,837,378,168	10,950,706,147	-	-	-	-							
		15	Collection ratio (%)	81	83	91	↗	NA	2	2	3		A	A	A	Introducing app, Improved payment system	Improving	
			Collection ratio (%) (Collected/ Current billed + arrears)					-	-	-	-							
		16	Non-revenue water ratio(%)	21.0	18.8	16.9	↗	NA	3	3	3		A	A	A	-No section responsible for NRW management -No action plan for reducing NRW	The ratio of functional meter is only 1 %. As a result, water tariff is set based on house size. It is considered that the billed water is different from the actual consumption of the customer.	
		17	Metering ratio (%)	3	2	1	↘	NA	1	1	1		A	A	A	-Major causes of NRW are high distribution pressure to the aged pipeline and regulating supply hours and without meter. -Only 1% functional meters. So for rest of connections fixed slab rate process is followed.	Given the ratio of functioning water meters, it can be said that the NRW ratio differs from the actual situation.	
Prerequisites	4. Management and Financial Improvement	18	Water tariff level (USD/6M3)	Depend on House Size	Depend on House Size	Depend on House Size	-	-	-	-				B	See Below N01. BD			
		19	Accounting system	IFS	IFS	IFS	-	NA	-	-	-					Depreciation is not counted in the PL		
		20	Net income (PKR)	-1,272,807,728	-903,112,000	14,139,000	↗	-	-	-	-		C	C	C	There is continuous deficit even though depreciation cost is not counted, but upward trend		
		21	EBITDA (PKR)	-1,260,127,496	-891,451,299	24,783,325	↗	-	-	-	-		C	C	C			
		22	EBITDA margin (%)	-19	-11	0.2	↗	NA	1	1	2		C	C	C	Negative EBITDA margin, but improving		
		23	EBITDA margin excl. deferred income (%)	-87	-81	-55	↗	NA	1	1	1		C	C	C	Negative EBITDA margin, but improving.		
		24	Total capital operating margin (%)	-3	-2	0	↗	-	-	-	-		C	C	C			
		25	Operating Profit Margin(%)	-11	-7	0	↗	NA	1	1	2		C	C	C			
		26	Equity ratio (%)	-25	-25	-22	↗	NA	2	2	2		C	C	C	Since there is accumulated losses, negative equity ratio		
		27	Fixed long term conformity rate (%)	104	106	106	→	NA	2	2	2		C	C	C			
		28	O&M cost coverage ratio (%)	53	51	73	↗	NA	1	1	1		C	C	C	This is very low		
		29	O&M cost coverage ratio excluding subsidies (%)	54	55	64	↗	NA	1	1	1		C	C	C			
		Financial soundness	30	Unit cost of water supply (PKR/m ³) (Overall cost including DEP/Water sold)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	-	-	-	-						
			31	Supply price (PKR/m ³) (Turnover from sales/ Water sold)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	-	-	-	-						
				Overall cost excluding depreciation expense	-12,611,265,769	-14,476,245,299	-17,475,534,675	↘	-	-	-	-		C	C	C		
				Overall cost including depreciation expense	-12,611,265,769	-14,476,245,299	-17,475,534,675	↘	-	-	-	-		C	C	C		
			32	Subsidies (PKR)	4,556,716,273	5,604,755,606	6,236,143,415	↗	-	-	-	-		C	C	C		
			33	Development Partner grant support (PKR)	32,869,390	1,009,820	19,017,288	Up down	-	-	-	-		C	C	C		
			34	The ratio of subsidies and DP support to turnover	67.9	70.3	55.6	↘	-	-	-	-		C	C	C		
HR efficiency	35		Number of staff per 1,000 connections	4.75	4.28	4.25	→	NA	3	3	3		A	A	A	Slightly improving and O&M seems to be very efficient.		

2. Analysis based on financial statements (FS analysis)

Summary

WASA-L operates water and sewerage services. Each revenue proportion is water 32% and sewerage 20% respectively. The rest is mainly accounted by amortization of deferred income.

The profitability is low as indicated negative EBITDA margin excluding deferred income. This led to the accumulated losses, although depreciation (revaluation surplus/deficit as well) is not recorded in the P/L.

While the O&M coverage ratio excluding subsidy has improved over last 4 years, it is still 75%. The WASA-L has been supported by subsidies.

Positive

The O&M coverage ratio excluding subsidy has improved over last 4 years.

The account receivables is only 16% of annual water and sewerage sales, meaning that tariff is collected in around 60 days. Further this figure is improving.

Negative

Profitability is low with -55.4% of EBITDA margin(excluding deferred income) in 2023. Operating profit margin used to be minus until 2022 but it became a slight positive with 0.1% in 2022. This contributed to the accumulated loss. However, it should be noted that WASA-L is operating sewerage and drainage service of which profitability is lower. Further, deferred credit (mainly government subsidy) accounts for 87% of the balance sheet and increasing by 8% annually

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	IFS and accrual accounting system is applied. However depreciation on assets is not recorded in P/L. Further, there is no cashflow statement.
	Comments by auditor	No information available
2	P/L	
	Profitability	Profitability is low, indicated by -55.4% of EBITDA margin(excluding deferred income) in 2023. While its operating profit margin has been negative until 2022, it became a slight positive with 0.1% in 2022. However, it should be noted that WASA-L is operating sewerage and drainage service of which profitability is lower.
	Revenues Composition	The revenue's 39% is water provision and its 25% is from sewerage, and its 33% from subsidy. This indicates that water operation is just one part of the revenue.
	Subsidy details and trends	36% of subsidy is included in P/L.
	Expenses Composition	Electricity and power accounts for 44% of total expenses, Salaries and other benefits 28%, Repair and maintenance only 11%, meaning that WASA-L has spent a limited money for Repair and maintenance. Further depreciation is not counted as expense.
3	B/S	
	Financing	The amount of long-term loan has been same over the last four years, because the repayment and interest has not happened as this the non-interest borrowing from the government. Further, the deferred credit (mainly government subsidy) accounts for 87% of the balance sheet and increasing by 8% annually
	Fixed Assets	Property, plant and equipment accounts for 73% of the total asset, meaning that the proportion of tangible asset is proper as water and sewerage service provider. However, as depreciation(revaluation surplus/deficit as well) is not counted in the P/L, the actual value might differ from the book value.
	Accounts Receivable	The account receivables is just 16% of annual water and sewerage sales, meaning that tariff is collected in around 60 days. Further this figure is improving
4	C/F	
	Trends	No Cash flow statement is available

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

The growth spiral from 1 to 2 is not working as water supply hours are short and intermittent, which the customers may not satisfy although 100% coverage and water quality are good. The functional metering ratio is very low at 1%, leading to flat-rate tariffs based on house size. The growth spiral from 2 to 3 is not working as further increase of turnover is not expected without metered tariff and estimation of NRW with metered consumption. While the NRW ratio is low, increase number of leaks indicate future increase of NRW.

While the O&M coverage ratio excluding subsidy has improved over last 4 years, it is still 75%. Thus the WASA-L has been supported by subsidies. It should be noted that the WASA-L does not record depreciation as expenses. Investments are financed by made using government subsidies. The spirals from 3 and 4 to 4 is not working. Therefore, the overall growth spiral is not working.

Based on the analysis, introducing water meters and improving NRW management would be essential for achieving sustainability and financial stability along with additional water resource development.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?

Diagnosis result

The scale of the water service is quite big in terms of water production and population served. The service coverage is 100% and the quality of the water supplied complies with most of the water quality standards, but the water supply pressure is very low and the supply hours are intermittent. Satisfaction of customers is unknown.

According to the response to the questionnaire, WASA-L relies on ground water, and continuous extraction is leading towards declination in water table. Therefore, now water is being supplied on intermittent basis as water conservation practice.

The growth spiral from 1 to 2 is not working as water supply hours are short and intermittent, which the customers may not satisfy although 100% coverage and water quality are good. WASA-L needs additional water resources to solve intermittent supply and meet increasing water demand.

Required detailed diagnosis

KPI #	KPI	Data (2023)	Stage of growth	Trend
1	Investment cost (PKR)	-	-	0
2	Production capacity (m ³ /day)	1,636,592	-	0
3	Production (m ³ /day)	1,459,294	-	0
4	Utilization ratio of production capacity (%)	89.17	-	0
5	Continuity of Service (Hrs/day)	11	1	→
6	Quality of water supplied (Compliance rate: %)	98	4	→
7	Water supply pressure	1~3m	1	→
8	Leakage ratio (%)	26,510	-	↘

(4→1) Is the financial improvement leading to investment activities?

Diagnosis result

WASA-L is investing to expand infrastructure asset by utilizing government subsidy.

As depreciation is not recorded in the financial statements, it is not clear that investment expenditure is more than the annual depreciation of assets.

WASA-L is not self-financing to investment activities.

The growth spiral from 4 to 1 is not working through own fund but government grant.

Required detailed diagnosis

Need to analyse for which infrastructure the subsidy is used and annual depreciation level.

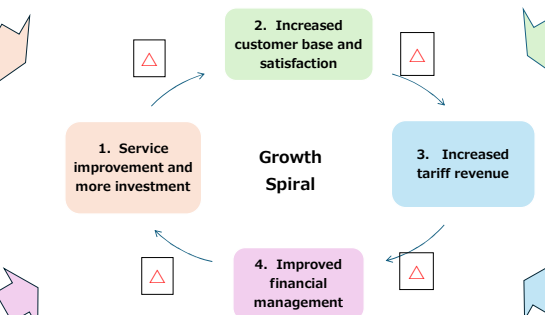
Legend

- Working well
- Working
- △ Not working well

Note:
The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

KPI #	KPI	Data (2023)	Stage of growth	Trend
9	Population served	8,700,000	-	0
10	Service coverage / Water coverage (%)	100	4	→
11	Customer satisfaction (%)	-	NA	0
12	Water sold (m ³ /day)	-	-	0
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	168	0	0

Note: Water consumption per capita is calculated as water production per capita.



KPI #	KPI	Data (2023)	Stage of growth	Trend
19	Accounting system	IFS	-	-
20	Net income (PKR)	14,139,000	-	↗
21	EBITDA (PKR)	24,783,325	-	↗
22	EBITDA margin (%)	0.22	2	↗
23	EBITDA margin excl. deferred income (%)	-55	1	↗
24	Total capital operating margin (%)	0	-	↗
25	Operating Profit Margin(%)	0	2	↗
26	Equity ratio (%)	-22	2	↗
27	Fixed long term conformity rate (%)	106	2	→
28	O&M cost coverage ratio (%)	73	1	↗
29	O&M cost coverage ratio excluding subsidies (%)	64	1	↗
30	Unit cost of water supply (PKR/m ³) (Overall cost including DEP/Water sold)	#VALUE!	-	-
31	Supply price (PKR/m ³) (Turnover from sales/ Water sold)	#VALUE!	-	-
32	Subsidies (PKR)	6,236,143,415	-	↗
33	Development Partner grant support (PKR)	19,017,288	-	Up down
34	The ratio of subsidies and DP support to turnover	56	-	↘
35	Number of staff per 1,000 connections	4	3	→

1MK= # DIV/0! USD

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?

Diagnosis result

Given the service coverage is 100%, customer satisfaction is improving. Functional metering ratio is only 1%, so the water tariff is set as a flat rate based on the house size. The NRW ratio is decreasing but the number of leaks is increasing, indicating pipes are aging and there is a possibility that NRW ratio will increase in the future. However, fundamentally, it is not possible to calculate NRW ratio without metered consumption or water volume sold. According to response to the questionnaire, there is no section on NRW management and no NRW management plan. Possibly, actual NRW is not low. In addition, water conservation by customers is not possible without adopting metered tariff, which increases further water resources. The growth spiral from 2 to 3 is not working as further increase of turnover is not expected without metered tariff and accurate NRW estimation.

Required detailed diagnosis

The calculation method of NRW ratio needs to be checked.
The reason for very low functional meter ratio need to be checked.
The metering policy.

KPI #	KPI	Data (2023)	Stage of growth	Trend
14	Turnover from sales(PKR)	10,950,706,147	-	0
15	Collection ratio (%)	91	3	↗
16	Non-revenue water ratio(%)	17	3	↗
17	Metering ratio (%)	1	1	↘
18	Water tariff level (USD/6M3)	Depend on House Size	-	0

(3→4) Is the tariff revenue improvement leading to financial improvement?

Diagnosis result

Profitability is low with -55.4% of EBITDA margin(excluding deferred income) in 2023. The continuous deficit cause until FY2021/2022 caused accumulated losses. In addition, depreciation (revaluation surplus/deficit as well) is not recorded in the P/L. This indicates in the first place the financial statements and tariff setting are not designed to achieve full-cost recovery including depreciation cost. While the O&M coverage ratio excluding subsidy has improved over last 4 years, it is still 75%.

Overall, the spiral from 3 to 4 is not working.

Required detailed diagnosis

Need to confirm to what extent WASA-L seeks full-cost recovery as they are operating sewerage and drainage service in addition to water supply, which is not basically profitable.

has been positive slightly

The Study on Growth of Water Utilities

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- Diagnostic Report -

Lusaka Water Supply & Sanitation Co., Ltd. (LWSC)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)

in association with

Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

0. Benchmarks

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2. FS analysis (Analysis based on financial statements)
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0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (ZMW)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)		—		—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—		—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(ZMW)				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%(15-25%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6m ³)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Accrual basis	—
Profitability		20	Net income (ZMW)	—	—	—	—
		21	EBITDA (ZMW)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	—
		26	Equity ratio (%)	Negative	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	—
		30	Unit cost of water supply (ZMW/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (ZMW/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (ZMW)	—	—	—	—
		33	Development Partner grant support (ZMW)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
Human resource efficiency	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Less than 4.0	

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the "Africa Executive Forum Utility Profile" appears to be "operating revenues/operation and maintenance expenses," we added "operating revenues from water services/operation and maintenance expenses" so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

Unit: million local currency

Category	Category in growth spiral	No.	JICA 21 KPIs	Key Performance Indicators (KPIs)	Utility name: LWSC			Improve ment	Stage of growth			Source			Remarks (Additional Information)	Initial diagnosis by indicator
					2021	2022	2023		2021	2022	2023	2021	2022	2023		
Service level	1. Service Improvement and Investment Activities	1		Investment cost (ZMW)	-	-	-		-	-	-				the priority areas for capital investment in the next 3 years ⊗ Water resource development ⊗ Water treatment plants ⊗ Network expansion ⊗ Others: Sewer Treatment Plants *C	
		2	3	Production capacity (m ³ /day)			344,529		-	-	-			C	Ground water 35% Surface water 65% *C	
		3		Production (m ³ /day)	290,597	290,411	279,060	↘	-	-	-	A	A	C		
		4		Utilization ratio of production capacity (%)			81.0		-	-	-			A	C	
		5	4	Continuity of Service (Hrs/day)	16	17.8	17	→	2	2	2	C	C	C	Production not able to meet demand* C	Remain unchanged
		6	5	Quality of water supplied (Compliance rate: %)	78	79	82	↗	2	2	3	C	C	C		Slightly increasing
		7	7	Water supply pressure	-	-	-		-	-	-				Demand is high and supply is not keep up with demand* C	
		8	13	Leakage ratio (%)	(4907)	(870)	(683)	↗	-	-	-	C	C	C	Indicator is breaks/year	Compared with 2021, the total number of pipes breaks per year in 2022 and 2023 significantly decreased
Business scale	2. Customer Increase and Trust	9	1	Population served		2,786,596	2,871,574	↗	-	-	-		A	C	Total Population in 2023: 3,003,739 *C	Population served increasing
				Active Connection	106,068	134,807	144,370	↗	-	-	-	A	A	C		The number of active connection is increasing
		10	2	Service coverage / Water coverage (%)	93.7	95.3	94.8	→	3	4	3	C	C	C		good
		11	6	Customer satisfaction (%)		53			NA	1	NA			C	Five main complaints: 1) Water Supply related complaints (No Water and Low pressure) 2) Sewer Related Complaints due to abuse of system 3) Billing Related Complaints (Bills too high) 4) Leakages 5) Leaking meters	Intermittent service and low pressure result in insufficient water supply, leading to very low customer satisfaction.
		12		Water sold (m ³ /day)		134,247	128,365	↘	-	-	-		A	C	the volume of water billed irrespective of whether the bill is paid or not.*C	
Cost-effectiveness	3. Water Tariff Profitability Improvement	13		Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#DIV/0!	48.2	44.7	→	-	-	-					
		14	14	Turnover from sales(ZMW)	413,015,615	442,033,706	361,684,336	↗	-	-	-	C	C	C	Total billing for water and sewer	While the "Total annual revenue" is increasing the turnover from water is decreasing
		15	10	Collection ratio (%)	107	95	74	↘	4	3	2	C	C	C	One of the reasons is a slow payment from the government *C	Significant decrease. This negative trend needs to be analysed.
		16	11	Non-revenue water ratio(%)	47	54	57	↘	1	1	1	C	C	C	Possible causes: Low metering ratio, Aged and dilapidated water network *C	It seems that the low metering rate is hindering the improvement of NRW.
		17	12	Metering ratio (%)	72.0	65.0	68.0	→	1	1	1	C	C	C	Insufficient investment in meter installations and replacement *C	Decreasing
Prerequisites	4. Management and Financial Improvement	18	9	Water tariff level (USD/6m ³)	1.28	1.28	1.28	→	-	-	-	D	D	D	Based on Water Tariff in 2021 +5.93ZMW/m ³ 6/m3/27.81ZWM/\$ The tariff is supposed to be revised every three years,but they have not adjusted since 2019 *C Tariff adjustments are entirely dependent on guidelines developed by the regulator, the Water Supply and Sanitation Council (NWASCO) and this has hindered tariff increments for many years, thereby affecting improved performance. *C It is not possible for the utility to reach 130% cost coverage by revenue because of the low tariffs	It appears that the regulator (NWASCO) has strong powers and prevents tariff increases.
		19	8	Accounting system	Corporate Accounting	Corporate Accounting	Corporate Accounting		-	-	-		C	C	However, financial statement is not available	
		20	15	Net income (ZMW)	539,415,373	746,311,727	-51,620,702	↘	-	-	-	B	E	E		Positive net income until 2022, but not sure if depreciation is included in the calculation. This has decreased and became negative in 2023
		21	16	EBITDA (ZMW)	605,339,037				-	-	-	B				
		22	17	EBITDA margin (%)	59.0%				2	NA	NA	B			Regarding the FY2019/2020, the EBITDA margin excluding the deferred income(revenue grant) is 59%. However, excluding its large foreign exchange gain, the EBITDA margin is -1%	
		23		EBITDA margin excl. deferred income (%)	51.0%				2	NA	NA	B				
		24	18	Total capital operating margin (%)	3.0	31.0	-1.8	↘	-	-	-	C	C	C		
		25	19	Operating Profit Margin(%)	133.0	146.0	-10.0	↘	3	3	1	C	C	C		
		26	20	Equity ratio (%)	-7.6	24.0	18.0	→	2	2	2	C	C	C		Used to be negative,but became positive after 2022
		27	21	Fixed long term conformity rate (%)	1.0	1.3	1.3	→	3	3	3	C	C	C		
		28		O&M cost coverage ratio (%)	119%	107.0%	71%	↘	1	1	1	B	A	A	The O&M cost in the Sector report might not include administrative staff cost.	It is not possible for the utility to reach 130% cost coverage by revenue because of the low tariffs
		29		O&M cost coverage ratio excluding subsidies (%)	98%				1	NA	NA	B			For this calculation, the foreign exchange gain is excluded.	
		30		Unit cost of water supply (ZMW/m ³) (Overall cost including DEP/Water sold)	#DIV/0!	8,743	11,265	↘	-	-	-					
		31		Supply price (ZMW/m ³) (Turnover from sales/ Water sold)	#DIV/0!	9,021	7,720	↗	-	-	-					
				Overall cost excluding depreciation expense	416,694,938	428,398,000	527,807,000	↘	-	-	-	C	E	E	The depreciation is not recorded	Overall cost increase by 23% in 2023
				Overall cost including depreciation expense	416,694,938	428,398,000	527,807,000	↘	-	-	-					
		32		Subsidies (ZMW)	86,366,152				-	-	-	C			Revenue grant. It is not clear if this is from government or OPs.	
		33		Development Partner grant support (ZMW)					-	-	-					
		34		The ratio of subsidies and DP support to turnover	17.0%				-	-	-	C			% of revenue grants to total income excluding foreign exchange gain	
HR efficiency		35		Number of staff per 1,000 connections	5.8	6.0	5.0	→	3	3	3	C	C	C	The number of staff is no adequate to meet the demands of the organisation. This is because of liquidity challenges; the Company has not filled all the staff as per organizational structure *C	The numbers remain low, but according to the questionnaire, LWSC is suffering from a lack of staff.

2. Analysis based on financial statements (FS analysis)

Summary

This financial analysis is mainly based on the LWSC's responses to the questionnaire, water sector report 2023, and strategic plan because of the non-availability of financial statements. Thus, it is very limited.

The profitability worsened recent two years. According to the sector report, the O&M coverage ratio is 107% in FY2022 and 71% in FY2023.

This deficit is covered by delayed payment for Energy costs particularly electricity.

Positive

Equity ratio used to be negative, but became positive after 2022, although the reason is not identified.

Negative

The profitability worsened recent two years. According to the sector report, the O&M coverage ratio is 107% in FY2022 and 71% in FY2023. The full cost recovery ratio (including depreciation, finance cost and allowable provisions), is 88% in FY2022 and 61% in FY2023.

This is due to the overall cost increased by 23% from 2022 to 2023 whereas revenue only increased by 3%, which caused the negative profit in 2023.

The account receivable amounts to 75% of the revenue from water and sanitation. This is concern.

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	Corporate accounting is applied. However, the depreciation seems not be recorded neither in the income statement in the strategic plan 2023-2027, nor in the sector report.
	Comments by auditor	-
2	P/L	
	Profitability	The profitability worsened recent two years. According to the sector report, the O&M coverage ratio is 107% in FY2022 and 71% in FY2023. The full cost recovery ratio (including depreciation, finance cost and allowable provisions), is 88% in FY2022 and 61% in FY2023. LWSC started record loss from FY2023. Its overall cost increased by 23% from FY2022 to FY2023 whereas revenue only increased by 3%, which caused the negative profit in 2023.
	Revenues Composition	74% of the revenue is water sales and 26% is sewer charges. Revenue from each operation increased only by 3% and 2% respectively from FY2022.
	Subsidy details and trends	FY 2021, the revenue grant was 17% of the total income. After that year, the information on the amount of grant income from the government and international donors is not available.
	Expenses Composition	In terms of the operating expenses, 39% is Personal cost (which seems excluding administrative staff cost) and 36% by Energy cost, which accounts for the major portion of operation cost. Those two expenses increased by 39% and 36%
3	B/S	
	Financing	Balance sheet is not available. However, according to LWSC's responses to the questionnaire, the government grants and concessional borrowings are the source of financing. LWSC is not allowed to borrow from commercial banks. LWSC is a private limited liability Company incorporated under the Companies Act. Regarding its shareholding, Lusaka City Council holds 43% of share, seconded by Kafue Town Council with 17%.
	Fixed Assets	LWSC owns its water assets.
	Accounts Receivable	The account receivable amounts to 75% of the revenue from water and sanitation. This is concern.
	Related party payables	No information
4	C/F	
	Trends	No cash flow statement available. However, the increase of account receivable by 39% and the increase of payable by 183% might indicate the difficulty of cash shortage.

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

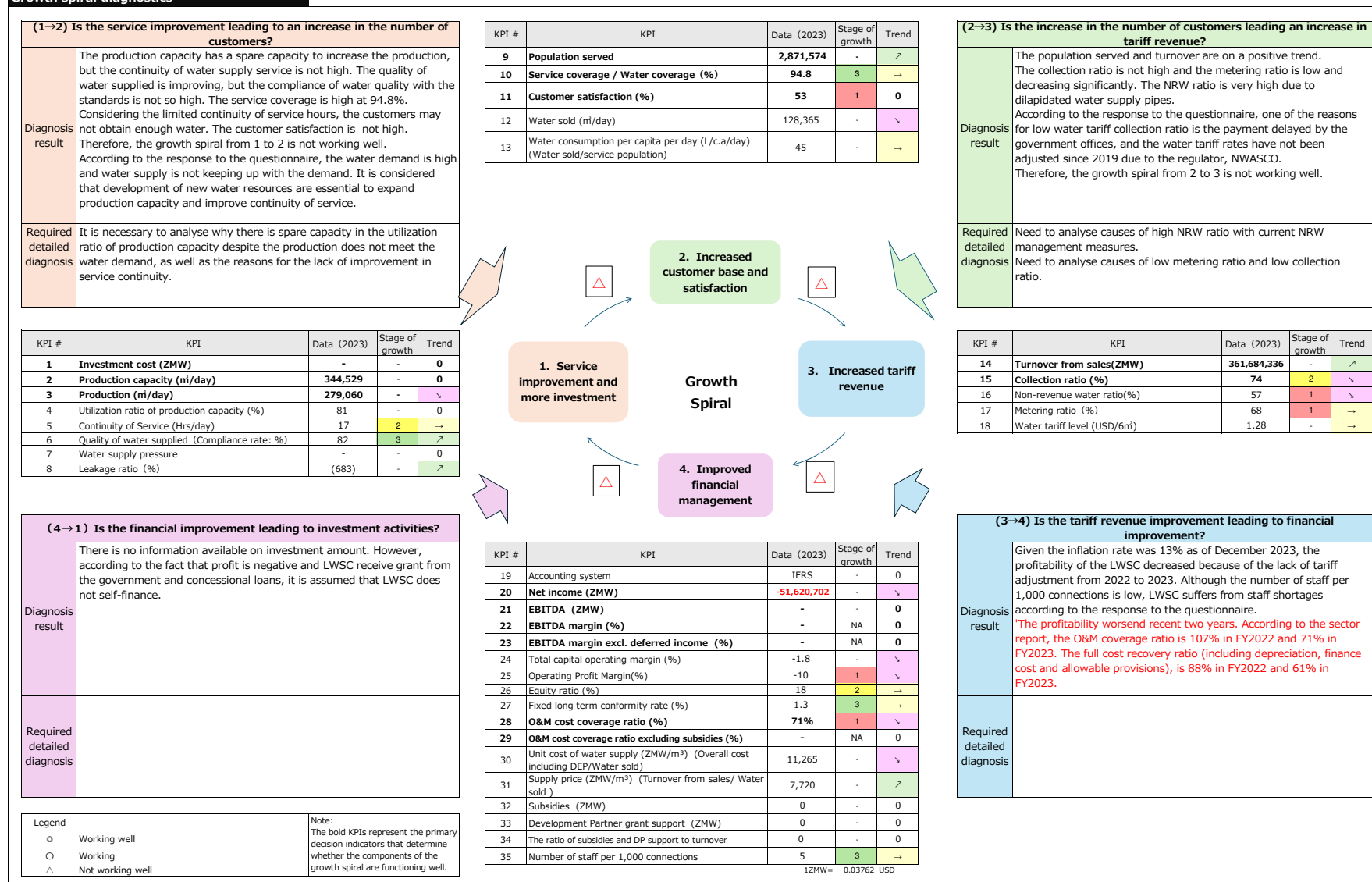
While LWSC has a high service coverage of 94.8%, its customer satisfaction is not high due to limited service hours and insufficient water supply. Despite improvements in water quality, it remains suboptimal. The utility faces high demand that outstrips supply, necessitating new water resources to expand capacity and improve service continuity.

LWSC struggles with low metering rates, high NRW, and unadjusted tariffs since 2019, leading to negative profitability. **Thus, the profitability worsened recent two years. According to the sector report, the O&M coverage ratio is 107% in FY2022 and 71% in FY2023. The full cost recovery ratio (including depreciation, finance cost and allowable provisions), is 88% in FY2022 and 61% in FY2023.**

In order to finance investments, LWSC relies on government grants and concessional loans. Staff shortages exacerbate operational challenges although the staff number per 1,000 connections falls in an appropriate range. Given the inflation rate of 13% as of December 2023, the lack of tariff adjustments has further decreased profitability. The growth spiral is not working well, highlighting the need for strategic improvements in metering, NRW management, tariff adjustment and financial planning to achieve a functional growth spiral.

It should be noted that the strategic plan 2022-2027 and the questionnaire states that the development of sanitation plant and network is priority.

Growth spiral diagnostics



The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic Report -

**Dar es Salaam Water Supply And Sanitation Authority
(DAWASA)**

February 2025



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3. GS diag (Diagnosis based on growth spiral)

0. Benchmarks

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (TZS)	–	–	–	–
		2	Production capacity (m/day)	–	–	–	–
		3	Production (m/day)	–	–	–	–
		4	Utilization ratio of production capacity (%)	–	–	–	–
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	–
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	–
		8	Leakage ratio (%)	–	–	–	–
Business scale	2. Increased customer base and satisfaction	9	Population served / connections	–	–	–	–
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	–
		12	Water sold (m/day)	–	–	–	–
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	–	–	–	–
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales(TZS)	–	–	–	–
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%(15-25%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	–	–	Aim for a level of sustainable investment	–
Prerequisites	4. Improved financial management	19	Accounting system	–	–	Accrual basis	–
Profitability		20	Net income (TZS)	–	–	–	–
		21	EBITDA (TZS)	–	–	–	–
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	–
		23	EBITDA margin excl. deferred income (%)	Negative	0%-40%	Aim for 40% or more	–
		24	Total capital operating margin (%)	–	–	–	–
Financial soundness		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	–
		26	Equity ratio (%)	–	Less than 40%	Aim for 40% or more	–
		27	Fixed long term conformity rate (%)	–	Above 100%	Aim for less 100%	–
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	–
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (TZS/m³) (Overall cost including DEP/Water sold)	–	–	–	–
		31	Supply price (TZS/m³) (Turnover from sales/ Water sold)	–	–	–	–
			Overall cost excluding depreciation expense	–	–	–	–
			Overall cost including depreciation expense	–	–	–	–
		32	Subsidies (TZS)	–	–	–	–
		33	Development Partner grant support (TZS)	–	–	–	–
		34	The ratio of subsidies and DP support to turnover	–	–	–	–
		Human resource efficiency	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5

Abbreviation: NA: Not available

*1: For the operating cost ratio, considering that the data in the “Africa Executive Forum Utility Profile” appears to be “operating revenues/operation and maintenance expenses,” we added “operating revenues from water services/operation and maintenance expenses” so that we can check the figures excluding the impact of subsidies and confirm the level of water service charges. The level of water service charges is also assumed to be available.

Similarly, EBITDA margin is also shown as two indices, including and excluding subsidies, etc.

*2 Subsidies are those that are recorded as revenues for each year on the P/L. Therefore, it differs from the disbursement amount for that year.

1. Diagnosis based on indicators (Index diag)

Unit: Thousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: BWB										Remarks (Additional information)	Initial diagnosis by indicator	
				KPI Values			Improve-ment	Stage of growth			Source					
				2020/2021	2021/2022	2022/2023		2020/2021	2021/2022	2022/2023	2020/2021	2021/2022	2022/2023			
Service level	1. Service Improvement and Investment Activities	1	Investment cost (TZS)		113,733,504	162,565,879	↗	-	-	-		C	C	Larger than depreciation.		
		2	Production capacity (m ³ /day)	508,849	508,849	524,137	↗	-	-	-	A	A	A	Production capacity has increased from 2021 to 2022		
		3	Production (m ³ /day)	399,699	386,575	354,110	↘	-	-	-	A	A	A	Production has decreased from 2020 and 2022		
		4	Utilization ratio of production capacity (%)	79	76	68	↘	-	-	-	-	-	-	The utilization ratio is low, and WTPs have spare capacity for production.		
		5	Continuity of Service (Hrs/day)	21	20	19	↘	2	2	2	A	A	A	Continuity of service had been reduced from 2020 to 2022.		
		6	Quality of water supplied (Compliance rate: %)	97	95	88	↘	4	4	3	A	A	A	E.Coli (% compliance) Residual Chlorine is very low at 19%(2022)	Compliance rate of E. Coli had been declined from 2020 to 2022.	
		7	Water supply pressure					-	-	-						
		8	Leakage ratio (%)					-	-	-						
Business scale	2. Customer Increase and Trust	9	Population served	6,173,749	6,539,993	4,998,135	↘	-	-	-	A	A	A	Total Population in Utility Service Area*Proportion of Population Directly Served with water (%)	The utility's service area appears to have changed. Population served had been sharply declined from 2021 to 2022.	
			Active Connection	343,091	370,982	409,717	↗	-	-	-	A	A	A	Same number with Total Water Connections	Increasing	
		10	Service coverage / Water coverage (%)	82	80	75	↘	3	3	2	A	A	A	Proportion of population directly served with water (%)	Water coverage had decreased from 2020 and 2022	
		11	Customer satisfaction (%)					NA	NA	NA	A	A	A	Not available		
		12	Water sold (m ³ /day)	-	-	-		-	-	-						
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#VALUE!	#VALUE!	#VALUE!		-	-	-						
Cost-effectiveness	3. Water Tariff Profitability Improvement	14	Turnover from sales(TZS)		135,326,391	135,283,233	→	-	-	-		C	C		The turnover did not change, which is in line with the decline of population served.	
		15	Collection ratio (%)	93.8	95.6	95.1	→	3	3	3	A	A	A	Revenue collection efficiency: The ratio of total collection (TZS) to the total billings (TZS) during the year	Collection rate remained high between 2020 and 2022. This is incoherent that the cash inflow from water and sewerage declined by 10%.	
		16	Non-revenue water ratio(%)	38.83	39.22	41.49	↗	2	2	1	A	A	A	During FY 2022/23, out of 85 WSSAs 17 had approved NRW reduction strategy (inc. DAWASA)	Non-revenue water ratio remained high between 2020 and 2022.	
		17	Metering ratio (%)	100	100	100	→	4	4	4	A	A	A		Metering ration remained 100% between 2020 and 2022.	
		18	Water tariff level (USD/6M3)	4.05	4.05	4.05	→	-	-	-				Average tariff (TZS/m ³): 1,663(2020), 1,663(2021), 1,633(2022)	Average tariff remained 1,663TZS/m ³ from 2020 to 2022.	
Prerequisites	4. Management and Financial Improvement	19	Accounting system	Accrual accounting	Accrual accounting	Accrual accounting	-	3	3	3		C	C			
		Profitability		20	Net income (TZS)		75,319,883	108,862,775	↗	-	-	-		C	C	
21				EBITDA (TZS)		101,146,217	134,780,433	↗	-	-	-		C	C		
22				EBITDA margin (%)		42	45	↗	NA	3	3		C	C		
23				EBITDA margin excl. deferred income (%)		2.9	-8.9	↘	NA	2	1		C	C		
24				Total capital operating margin (%)		9.3	10.7	↗	-	-	-		C	C		
25				Operating Profit Margin(%)		31.3	37.0	↗	NA	3	3		C	C		
26				Equity ratio (%)		71.3	70.2	↘	NA	3	3		C	C		
Financial soundness		27	Fixed long term conformity rate (%)		115.1	113.1	↗	NA	2	2		C	C		Over 100% is not good for stability	
		28	O&M cost coverage ratio (%)		168	183	↗	NA	3	3		C	C			
		29	O&M cost coverage ratio excluding subsidies (%)		101	91	↘	NA	2	1		C	C		Dependent on subsidies	
		30	Unit cost of water supply (TZS/m ³) (Overall cost including DEP/Water sold)	#VALUE!	#VALUE!	#VALUE!	-	-	-	-		C	C			
		31	Supply price (TZS/m ³) (Turnover from sales/ Water sold)	#VALUE!	#VALUE!	#VALUE!	-	-	-	-		C	C			
			Overall cost excluding depreciation expense		145,133,488	162,165,851	-	-	-	-		C	C			
			Overall cost including depreciation expense		167,221,538	186,665,075	-	-	-	-		C	C			
		32	Subsidies (TZS)		2,234,769	10,505,369	↗	-	-	-		C	C			
		33	Development Partner grant support (TZS)		94,634,863	137,446,964	↗	-	-	-		C	C			
		34	The ratio of subsidies and DP support to turnover		39.8	49.9	↗	-	-	-		C	C			
HR efficiency		35	Number of staff per 1,000 connections	4.4	4.0	4.0	→	3	3	3	A	A	A		Number of staff per 1,000 connections decreased from 2020 to 2021 but not under 4.0.	

2. Analysis based on financial statements (FS analysis)

Summary

- While the revenue from the water and sewerage charges has stagnated from FY2021/2022 to FY2022/2023 with almost 0% growth, the total expenses increased by 12%. Thus the O&M cost coverage ratio excluding subsidies and depreciation worsened to 91% from 101%. However, DAWASA's profitability was supported by increased "Amortization of government grants" and "Revenue grant". Those two types of grants account for 50% of the total revenue.

- It should be noted that DAWASA's sewer connections is over 17,000 in FY2022/2023. In FY2022/2023, DAWASA acquired land and completed design for the construction of wastewater treatment facilities. Thus, the wastewater service will increase in the future. The proportion of Population Connected to Sewerage Network (%) is 12.35%

Positive

The "Property, plant and equipment" was increased by 28%, partly due to completion of capital work. This enhanced PPE is expected to result in revenue increase in coming years.

Negative

The trade and other receivables has increased by 87%, which accounts for 79% of the water and sewerage charges. This impacts negatively the cashflow.

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	Accrual accounting
	Comments by auditor	Auditor general states there is no key audit matter.
2	P/L	
	Profitability	While the revenue from the water and sewerage charges has stagnated from FY2021/2022 to FY2022/2023, the total expenses increased by 12%. Thus the O&M cost coverage ratio excluding subsidies and depreciation worsened to 91% from 101%.
	Revenues Composition	"Amortization of government grants" and "Revenue grant" account for 50% of the total revenue.
	Subsidy details and trends	Revenue grant increased.
	Expenses Composition	Among the operating expenses excluding depreciation, "Water production and distribution costs" accounts for 31% and "Salaries, wages and employee benefits" accounts for 32%.
3	B/S	
	Financing	The "Fixed long term conformity rate" is 113%. This is concern.
	Fixed Assets	The "Property, plant and equipment" was increased by 28%, partly due to completion of capital work. This enhanced PPE is expected to result in revenue increase in coming years.
	Accounts Receivable	The trade and other receivables has increased by 87%, which accounts for 79% of the water and sewerage charges. This impacts negatively the cashflow.
4	C/F	
	Trends	"Net cash (used in)/ generated from operations" turned to negative, due to the decrease of "water and sewerage charges." The operating cash outflow and investment outflow are supported by development grants for projects. Thus the cash at hand increased.

3. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

DAWASA's service has not improved, indicated by the lack of the production volume increase. Thus, both the service coverage and served population declined. While the turnover from water and sewerage charges remains at the same level, the expenses increased. Thus the increase of net income was only due to increase of grants. This is shown by the EBITDA margin excluding deferred income's decline. Thus, almost all investments are financed by development partners' grant. The "Property, plant and equipment" was increased by 28% in FY2022/2023, partly due to completion of capital work. This enhanced PPE is expected to result in revenue increase in coming years. Over all, the spiral is not working well.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?

Diagnosis result
The spiral from 1 to 2 is not working well. From 2021 to 2022, the production capacity has increased by about 15,000 m/d. However, the production volume had declined and hence utilization ratio of production capacity had also decreased. This declining production appears to have led to shorter continuity of service and lower water coverage. It seems the service has not been improved. Those capacity drop might be due to delays in the implementation of projects. It was pointed out in the general report by the controller and auditor general in FY2022/2023, the delay in implementation of DAWASA's water project to drill 20 boreholes in Kigamboni had been delayed for about eight years, resulting in a cost overrun of TZS 7.97 billion. At the end of FY2022/2023, the 20 boreholes were completed. Other delays in the implementation of Ubungu Msakuzi North line extension project is also stated.

Required detailed diagnosis
The background to the decline in production needs to be examined in more detail.
-The reason of delay in implementation of projects and its impacts need to be verified.

KPI #	KPI	Data (2022)	Stage of	Trend
1	Investment cost (TZS)	162,565,879	-	↗
2	Production capacity (m/day)	524,137	-	↗
3	Production (m/day)	354,110	-	↘
4	Utilization ratio of production capacity (%)	68	-	↘
5	Continuity of Service (Hrs/day)	19	2	↘
6	Quality of water supplied (Compliance rate: %)	88	3	↘
7	Water supply pressure	0	-	0
8	Leakage ratio (%)	0	-	0

(4→1) Is the financial improvement leading to investment activities?

Diagnosis result
The spiral 4 to 1 is dependent on the grants but not by own funding. The O&M cost coverage ratio excluding subsidies and depreciation deteriorated to 91% from 101%. Thus, almost all investments are financed by development partners' grant. The "Property, plant and equipment" was increased by 28%, partly due to completion of capital work. This enhanced PPE is expected to result in revenue increase in coming years.

Required detailed diagnosis

Legend
○ Working well
○ Working
△ Not working well

Note:
The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

KPI #	KPI	Data (2022)	Stage of	Trend
9	Population served	4,998,135	-	↘
10	Service coverage / Water coverage (%)	75	2	↘
11	Customer satisfaction (%)	0	NA	0
12	Water sold (m/day)	-	-	0
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	#VALUE!	-	0

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?

Diagnosis result
- The spiral 2 to 3 is not working well. Given the decrease of population served and service coverage, the turnover remains at the same level. The high NRW is also a challenge. On the positive side, the collection ratio and metering ratio remain high.
- The average tariff remains same at 1,663 TZS/m from 2020 to 2022. This might be because the tariff adjustment requires no objection letter by the Ministry.
- The report by the controller and auditor general noted that DAWASA had not disconnected customers who had outstanding bills of TZS 10.87 billion. This might should have impacted the collection ratio. However the collection ratio remains stable.

Required detailed diagnosis
- The causes of NRW need to be investigated.
- The reason of decline in population served needs to be verified because the report by the controller and auditor general noted that the government expanded DAWASA operations by merging the functions of DAWASA and DAWASCO and extended its operational service to include areas that were previously served by Chalinze WSSA, Mkuranga WSSA and Kisarawe WSSA.

KPI #	KPI	Data (2022)	Stage of	Trend
14	Turnover from sales(TZS)	135,283,233	-	→
15	Collection ratio (%)	95.1	3	→
16	Non-revenue water ratio(%)	41.49	1	↗
17	Metering ratio (%)	100	4	→
18	Water tariff level (USD/6M3)	4.05	-	→

(3→4) Is the tariff revenue improvement leading to financial improvement?

Diagnosis result
The spiral 3 to 4 is not working well. While the turnover from water and sewerage charges remains at the same level, the expenses increased. Thus the increase of net income was only due to increase of grants. This is shown by the EBITDA margin excluding deferred income's decline.

Required detailed diagnosis

KPI #	KPI	Data (2022)	Stage of	Trend
19	Accounting system	crual accountin	3	-
20	Net income (TZS)	108,862,775	-	↗
21	EBITDA (TZS)	134,780,433	-	↗
22	EBITDA margin (%)	45	3	↗
23	EBITDA margin excl. deferred income (%)	-9	1	↘
24	Total capital operating margin (%)	11	-	↗
25	Operating Profit Margin(%)	37	3	↗
26	Equity ratio (%)	70	3	↘
27	Fixed long term conformity rate (%)	113	2	↗
28	O&M cost coverage ratio (%)	183	3	↗
29	O&M cost coverage ratio excluding subsidies (%)	91	1	↘
30	Unit cost of water supply (TZS/m³) (Overall cost including DEP/Water sold)	#VALUE!	-	↘
31	Supply price (TZS/m³) (Turnover from sales/ Water sold)	#VALUE!	-	-
32	Subsidies (TZS)	10,505,369	-	↗
33	Development Partner grant support (TZS)	137,446,964	-	↗
34	The ratio of subsidies and DP support to turnover	50	-	↗
35	Number of staff per 1,000 connections	4.0	3	→

1TZS= 0.00037 USD

Appendix 6 Excel analysis format for diagnosis and solutions of Category C

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnosis and Potential Solutions -

Metropolitan Cebu Water District (MCWD)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)

in association with

Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

S. Overall Summary

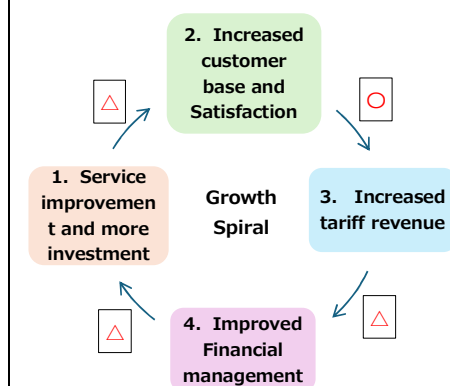
1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
- 3a. Bottleneck analysis (details)
0. Benchmarks
- 7.1. PL-NRW1 (NRW reduction benefit- Case 1)
- 7.2. PL-NRW2 (NRW reduction benefit- Case 2)

S. Overall Diagnostics and Solution

Utility name : Metropolitan Cebu Water District (MCWD)

Summary of Growth Spiral diagnostics

The coverage rate has remained at a low level of around 30% over the past four years. The spiral from 1 to 2 is not working well. The spiral from 2 to 3 is working but revenue increase is minimal. Overall financial results are in an up and down trend and not enough for major investment with own fund, but retained earning is increasing. The spiral from 3 to 4 is not working. The spiral from 4 to 1 is not working well. This may be the critical point to increase capital investment to boost the facility capacity followed by increase of service coverage and water sales. High Non-Revenue Water (NRW), especially leakage, is deteriorating profitability and hindering the effective use of limited water resources.



Refer to "4.GS diag"

Legend

- Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "3.Summary of bottleneck analysis"

The major problems in MCDC are low coverage with their network and limited water resources for water supply.

1. Increasing costly water resources and less potential for development of water resources
2. Degradation ground water and increasing connection request
3. Infrastructure Limitations
4. Increasing NRW
5. Training needs
6. Limited funding

External factors

7. Regulatory fragmentation
8. Delay of tariff adjustment by LWUA
9. Limited financing support
10. Limited support and collaboration/coordination with political and government administrations (LGUs, DENR, DPWH, and NWRB)
11. Unregulated groundwater resource development and management
12. Limited resilience to Climate Change & Disasters
13. Lack of DP support

Summary of Recommendations for Improvement

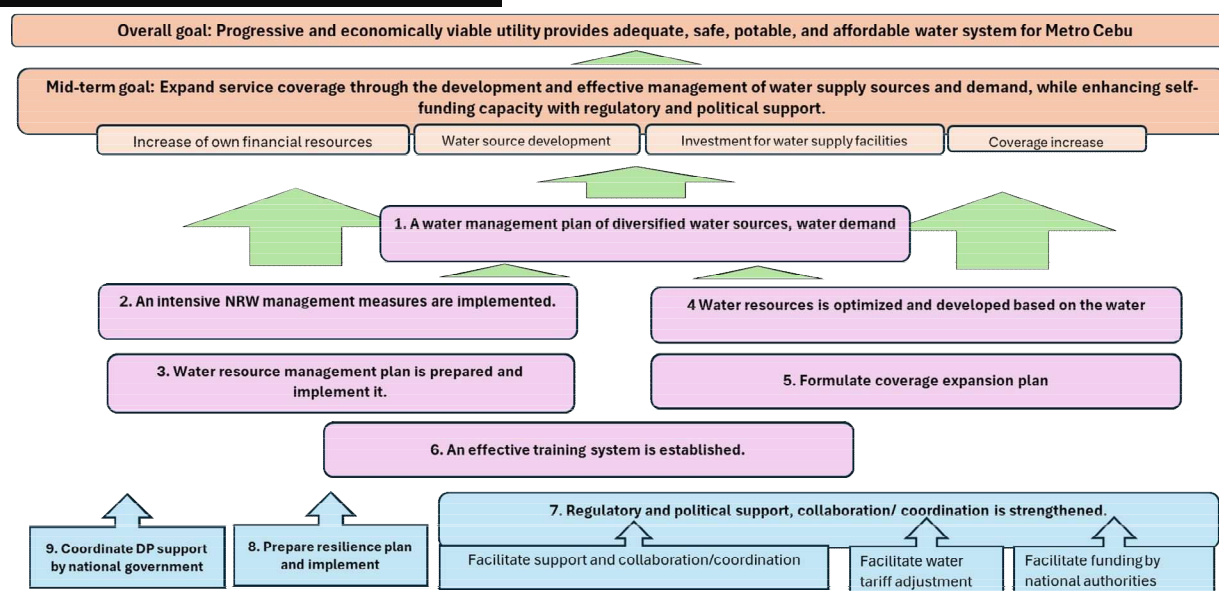
Refer to "5.Strategy analysis"

Mid-Term Goal:

There are interconnecting challenges and bottlenecks for increase of service coverage including water source development and management, infrastructure investment for pipelines, operational efficiency including high NRW. For overcoming these bottlenecks and paving the way for the utility's growth and resilience, more regulatory and political supports will be necessary. The key to turning the spiral is to increased support by regulatory and political bodies, which will lead to increase of finance and investment for development of water sources, increase of customers and decrease NRW.

Potential Solutions (Scenario for Improvement)

Refer to "6.Solution"



1. Diagnostics based on indicators (Index diag)

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: MCWD																Remarks (Additional information)	Initial diagnosis by indicator		
				KPI Values				Improvement trend	Stage of growth				Year				Source						
				2020	2021	2022	2023		1	2	3	4	1	2	3	4	1	2	3			4	
Water service	Service Improvement and Investment Activities	1	Investment cash out ('000')		180,872,399	234,230,648	238,147,604	→	-	-	-	-		2021	2022							Moderate level, but almost equivalent to annual depreciation cost	
		2	Production capacity (m/day)	234,816	231,669	256,001	276,058	↗	-	-	-	-				2023	I	I	I	F			
		3	Production (m/day)	216,572	234,395	251,560	275,993	↗	-	-	-	-	2020	2021	2022	2023	B	C	D	I	MCWD Website: 276,855 (2024)	On a increasing trend (7-8%)	
		4	Utilization ratio of production capacity (%)	92.2	101.2	98.3	100.0	-	-	-	-	-											
		5	Continuity of Service (Hrs/day)	21.97	21.45	22	21.91	→	2	2	2	2	2020	2021			A	A	I	I	21.97(2019)	Not 24/7, but more than 20 hours	
		6	Quality of water supplied (Compliance rate: %)	100	100.0	100.0	100.0	-	4	4	4	4											
		7	Water supply pressure (% of 24/7 supply of water)				74.7% (24/7)	-	-	-	-	-									10 PSI (0.07 MPa) is the lower limit of "moderate water pressure". 0.05~0.21MPs. 0.1 Mpa average.		
		8	Leakage ratio (%)		27.75	30.48	32.30	↘	-	-	-	-		2021	2022	2023		G	G	G			
	Customer Increase and Trust	9	Population served / connections	198,911	200,959	204,109	205,882	↗	-	-	-	-	2020	2021	2022		A, B	A, C	D	F	Total connections	Service connection. 1.0-1.6% increase per annum	
			Population served	609,280	632,121	642,167																	
		10	Service coverage / Water coverage (%)	31	31	31	32	→	1	1	1	1	2020	2021		2023	A	A		F	Water demand coverage. 33(2019)	Low coverage rate, need to check the status of water supply conditions in unseared area	
			Service coverage (Population)	24.2	24.9	25.0																	
		11	Customer satisfaction (%)		93			-	NA	3	NA	NA		2021				E			Satisfaction survey: 82.81(2019)	Very high	
		12	Water sold (m/day)	162,039	163,959	169,375	183,271	↗	-	-	-	-				2023	B	C	D	I			
		13	Water consumption per capita per day (L/c.a/day) - (Water sold)/(connection*family size)	191.2	191.5	194.8	209.0	-	-	-	-	-									an average of 4.26 members per household in Cebu City in 2015 Census		
			Water consumption per capita per day (L/c.a/day) - (Domestics)			156.0	156.0												K	K			
Management	Water Tariff Profitability Improvement	14	Turnover	1,748,284,383	1,793,903,962	1,819,623,452	2,055,967,702	↗	-	-	-	-	2021	2022							It is stagnant even though production increases		
		15	Collection ratio (%)	79	80	80	81.2	→	2	2	2	2	2020	2021		2023	A	A	I	I	Decreased in 20/21 and stays around 80%, which is not high		
			Collection efficiency (%)	89.2	91	91	92.4	↗									MCWD	MCWD	MCWD	MCWD	billing collected from accounts each year excluding the beginning balance		
		16	Non-Revenue Water ratio(%)	25.2	30.1	32.7	33.38	↘	2	2	2	2	2020	2021	2022	2023	B	C	D	F	HP: 34.68 (2024)	High NRW, and increased continuously.	
		17	Metering ratio (%)	100	100	100	100	→	4	4	4	4				2023	I	I	I	F			
		18	Water tariff level (6m3/month/household, local currency)					-	-	-	-	-											
	Management and Financial Improvement	19	Accounting system	PERS	PERS	PERS	PERS	-												I		Enterprise accounting system	
		20	Net income ('000')	7,688,817	34,272,313	15,285,205	48,521,215	↗	-	-	-	-	2020	2021	2022	2023				I		Positive net income but on a decreasing trend between 2021 and 2022.	
		21	EBITDA ('000')	331,663,586	270,681,616	208,302,126	247,786,435	Updown	-	-	-	-	2020	2021	2022	2023				I		Decreasing trend	
		22	EBITDA margin (%)	18.97	15.09	11.45	12.05	Updown	2	2	2	2	2020	2021	2022	2023						Decreasing trend and net sufficient to borrow investment fund, ideally more than 40%.	
		23	EBITDA margin excluding deferred income ('000')	15.05	11.26	9.58	11.78	Updown	2	2	2	2											
		24	Total capital operating margin (%)	1.48	0.66	0.29	0.86	→	-	-	-	-	2020	2021	2022	2023							
		25	Ordinary profit margin (%)	4.86	2.53	1.39	2.86	→	2	2	2	2	2020	2021	2022	2023							
		26	Equity ratio (%)	75.64	76.60	77.14	71.92	→	3	3	3	3	2020	2021	2022	2023						High equity ratio with retained earnings. Need to check the reason why MCWD does not seek borrowing loans for expansion.	
		27	Fixed long term conformity rate (%)	68.53	68.10	68.50	67.17	→	3	3	3	3	2020	2021	2022	2023							
		28	O&M coverage ratio (%)	123.29	117.57	113.29	114.24	→	2	2	2	2	2020	2021	2022	2023						Slight decreasing trend	
		29	O&M coverage ratio excluding subsidies (%)	118.47	112.19	110.57	113.39	→	2	2	2	2	2020	2021	2022	2023						Slight decreasing trend	
		30	Unit Cost of Water Supply (Currency/m³)	29.3	30.6	29.7	29.9	-	-	-	-	-									I		
		31	Supply Price (Currency/m³)	29.6	30.0	29.4	30.7	-	-	-	-	-									I		
			Overall cost excluding depreciation expense	1,475,286,872	1,602,000,873	1,645,738,633	1,813,251,467	-	-	-	-	-									I		
			Overall cost including depreciation expense	1,730,962,477	1,832,402,726	1,838,541,032	2,000,433,000	-	-	-	-	-									I		
		32	Subsidies ('000')	68,604,718	68,604,718	34,044,621	5,642,701	↘	-	-	-	-	2020	2021	2022	2023				I			
		33	Development Partner grant support ('000')	No information	No information	No information	No information	-	-	-	-	-									I		
		34	The ratio of subsidies and DP support to turnover (%)	0.04	0.04	0.02	0.00	→	-	-	-	-								I		Very little amount meaning MCWD is financially independent.	
		35	Number of staff per 1,000 connections	3.94	3.93	3.91	4.18	→	4	4	4	3	2020	2021		2023	A	A	I	I	4.25(2019)	Shows high efficiency as it is below 4.0	
				2020	2021	2022	2023	Source															
			Inflation	2.39	3.93	5.82	5.98	H														3 year average	5.2
			26/12/2020	31/12/2021	31/12/2022	28/12/2023																	
			Exchange rate	0.0210	0.0196	0.0180	0.0180	I															
	Difference		-7%		-8%																		

Source A 2023 Utility Profile Graphs (The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in Asia)
 B Annual Report 2020
 C Annual Report 2021
 D Annual Report 2022
 E Customer Satisfaction Report 2021
 F Annual Report 2023
 G Water balances (2021, 2022, 2023)
 H https://www.macrotrends.net/global-metrics/countries/PHL/philippines/inflation-rate-cpi#google_vienetta
 I <https://www.google.com/finance/quote/SBD:USD?window=5y>
 J Sourcing (Opinion piece by Alex Magno) 2023/3/30, <https://www.pids.gov.ph/details/news/in-the-news/sourcing-opinion-piece-by-alex-magno#:~:text=According%20to%20the%20Philippine%20Institute%20for%20Development%20Studies%2C,48%20to%20108%20liters%20of%20water%20per%20day.>
 K 5. Other KPIs 2023 pbb performance-target - as of Dec 2023 (MCDC)

2. Analysis based on Financial Statements (FS analysis)

Summary

MCWD's O&M coverage ratio (%) is 113%. MCWD is self-sufficient and does not neither receive subsidies nor transfers from the governments to supplement revenues. MCWD generate at least a profit on a full-cost recovery basis, which has been accumulated as retained earnings.

MCWD is unable to secure loans for major investments, such as expanding the water supply system, developing water sources, or replacing aging pipelines, due to its insufficient O&M cost coverage ratio. As a result, MCWD primarily utilizes own funds for small-scale and short-term investments. MCWD also invests short-term cash equivalent in institutions such as the Development Bank of the Philippines, which is a temporary, short-term measure rather than a regular practice.

Positive

-MCWD generate at least a profit on a full-cost recovery basis.
-Net debt ratio is only 5%. The company has accumulated considerable retained earnings, which account for approximately 60% of B/S. This means MCWD has sufficient financial stability

Negative

- EBITDA margin is just over 12% and RoA is around 0.3%, with room for improvement.
- MCWD did not invest/leverage its own funds in facility expansion.
- "Infrastructure Assets" is already 65% depreciated, suggesting the infrastructure is old.
- MCWD has recorded zero financial cash inflow for the past three years, investment cash outflow has been just equivalent to depreciation.

Analysis

No.	Category	Analysis
1	Basic information	
	Accounting standards	The company uses corporate accounting and follows the Philippine Financial Reporting Standards (PFRS). It uses accrual accounting
	Auditor's comment	(Commission on Audit (COA) makes audit on MCWD. However the auditor report has not yet obtained)
2	P/L	
	Profitability	- EBITDA margin is just over 12% and RoA is around 0.3%, with room for improvement. O&M coverage ratio (%) is 113%. - High non-revenue water ratio (33%) and maintenance costs seem to be the main reasons.
	Revenues Composition	- 96% of revenues are derived from "Waterworks System Fees" and less from wastewater services.
	Subsidy details and trends	- MCWD does not receive subsidies or transfers from the governments to supplement revenues. - MCWD bears costs for the items that would be funded by transfers or subsidies from the governments in other countries, such as the installation of fire hydrants and a 5% discount for elderly households (60 years and older).
	Expenses Composition	- "Maintenance and Other Operating Expenses" accounts for 57% and "Generation, Transmission and Operation Expenses" accounts for 42%, and personal expenses accounts for 32% of total operating expenses. The breakdown of "Generation, Transmission and Operation Expenses" need to be checked.
3	B/S	
	Financing	- Net debt ratio is only 5%. The company has accumulated considerable retained earnings, which account for approximately 60% of B/S. - MCWD invested in the Development Bank of the Philippines and other short-term investments. It is necessary to investigate why MCWD cannot leverage its own funds in facility expansion.
	Fixed Assets	- "Property, Plant and Equipment" only increased by 4% in FY2022. Among them, the major asset is "Infrastructure Assets", accounting for 44%. The next is land, accounting for 29%. - "Infrastructure Assets" is already 65% depreciated, suggesting the infrastructure is old.
	Accounts Receivable	- The receivable is 111 days of sales, which is deteriorating. - Liquidity ratio is 335% and this could be too high.
4	C/F	
	Trends	MCWD has recorded zero financial cash inflow for the past three years, investment cash outflow has been low. Thus the facilities have not been expanded.

JICA Exchange rate in Nov 2024

1Peso: 2.63168 Yen

1USD: 153.234 Yen

1Peso: 0.01717 USD

GDP per capita (US\$)

3725.6 <https://data.worldbank.org/country/philippines?view=chart>

Year 2023, WB

3. Summary of bottleneck analysis

Summary of bottleneck analysis	
Bottleneck analysis	Potential measures
The major problems in MCDC are low coverage with their network and limited water resources for water supply. 1. Increasing costly water resources and less potential for development of water resources Water resources are scarce due to limited number of water resources, and competition for water resources, and illegal deep wells. The groundwater has no potential due to increasing salinity and nitrate pollution. The MCWD's 10-years plan envisages the costly development of surface water (river), which is located far from Cebu Metropolitan area, along with the use of high-price seawater desalination. 2. Degradation ground water and increasing connection request The water resource management is limited. Over-reliance on groundwater in Metro Cebu leads to depletion and saltwater intrusion; degraded watersheds like Buhisan and Mananga reduce recharge capacity. While no official coverage data is available, it is estimated that only 3% of the population relies on piped water, while 65% use private wells as their primary water source. Groundwater quality deterioration is leading some users to seek MCWD connections. 3. Infrastructure Limitations Aging pipelines in Metro Cebu cause frequent leaks; inadequate storage, treatment, and septage facilities hinder service reliability and sanitation efforts. 4. Increasing NRW The lowest NRW was 19% but has been increasing and reached to 34.68% (first quarter of 2024), which hinder to increase water supply and improve better financial conditions. Non-physical losses including pilferages/illegal connection, fire trucks managed by LGUs, etc. are other factors increase NRW in addition to leakage from aged network with high pressure. 5. Training needs There are training needs (Request from MCWD to JICA Philippine office in Dec 2024). The training centre is under construction but the training program has not been prepared in advance. Regarding NRW management, NRW repair team is small (6-7 staff) and NMCWD need NRW management training: NRW Leak Detection	Approaches for Solutions (MCWD) 1) Infrastructure Upgrades: Phased pipeline replacement, expanded treatment plants, and enhanced septage facilities for Metro Cebu to meet growing demands and environmental compliance. 2) Diversifying Water Sources: Develop surface water (dams), desalination technologies for coastal areas, water reuse systems, and conduct hydrogeological studies to sustain Metro Cebu's supply. 3) Strengthening Resilience: Climate-resilient infrastructure designs and emergency water supply systems to mitigate impacts of disasters on Metro Cebu's water service. 4) Policy & Regulatory Compliance: Regular monitoring of water quality, streamlining permit processes, and closer collaboration with LGUs and agencies in Metro Cebu. 5) Community Engagement: Educational campaigns and community programs in Metro Cebu to encourage water conservation and watershed protection participation. 6) Capacity Building: Training staff in modern practices and partnering with international experts to improve operations and performance in Metro Cebu.
External factors	
6. Limited funding Investment activities, such as water source development, network expansion, and replacement, face funding challenges. Despite having retained earnings on its balance sheet although it is limited, MCWD does not seek borrowings. The limited borrowing capacity and restricted financial options, primarily due to delays of decisions regarding the approval of water tariff adjustments, represent a significant bottleneck. 7. Regulatory fragmentation Regulatory fragmentation is a major issue due to the lack of a unified water governance body within the government. There is a plan to establish a Department of Water within the Ministry, which is currently under Congress review. This initiative is crucial as multiple agencies, including LWUA (Presidential Office), DENR, and NWRB, require coordination, highlighting the need for a centralized regulatory body. 8. Delay of tariff adjustment by LWUA The existing tariff was set in 2015 since then it has been not changed. Water tariffs don't reflect true costs and restrict Metro Cebu's financial capacity for investments. Water tariff adjustment for achieving 10-years plan, which include investment plan has been proposed to LWUA in Dec 2022, which has not been approved. 9. Limited financing support Financing and borrowing are regulated by LWUA. Pending approval limits the borrowing capacity of MCWD. LWUA lending is not functioning. Loan request from MCWD has not approved. Difficult environment for investment projects. Financing remains a challenge, as obtaining a national loan involves complex procedures. Direct funding to MCWD is needed. 10. Limited support and collaboration/coordination with political and government administrations (LGUs, DENR, DPWH, and NWRB) The metropolitan Cebu composed of 8 LGUs. Multiple LGUs cause misaligned plans and conflicting priorities, hindering cohesive water management strategies. LGUs are an obstacle to promoting water projects (no excavation permits for laying pipelines are issued). MCWD needs more support from political and government stakeholders including DPWH to install pipelines for expansion of service area and replace aged pipelines. Furthermore, surface water source development needs the coordination with stakeholders, where water supply sources and development are located. 11. Unregulated groundwater resource development and management Groundwater is the main water source of MCWD. In the area, privates are permitted or freely to drill private wells which put burden on ground water use of MCWD. In addition, an increase in salinity and contamination by nitrate in groundwater reduce their development potential. A close coordination with regulatory bodies such as NWRB and LGUs is important on permission and pollution control. 12. Limited resilience to Climate Change & Disasters Metro Cebu faces droughts, flooding, and typhoons, reducing water availability and damaging infrastructure. 13. Lack of DP support There is little DP support in terms of technical and financial cooperation (only JICA).	Measures for collaboration (MCDC): 1) LWUA: Technical and financial assistance for projects in Metro Cebu; alignment with national strategies for wastewater treatment and water supply improvement. 2) DENR: Joint initiatives for watershed management and reforestation; monitoring water quality in Metro Cebu's catchment areas. 3) DPWH: Synchronization of road and pipeline projects; integration of water supply planning with Metro Cebu's urban infrastructure development. 4) NWRB: Strengthened compliance with water allocation and groundwater permits regulations; support for optimizing resource management strategies in Metro Cebu. 5) LGUs: Joint programs on water conservation, sanitation, and enforcement of ordinances protecting Metro Cebu's water sources.
Potential measures (JICA Team)	
1. Diversified water resources development and management Diversifying water sources are required. An efficient water use is important to make a maximum use of MCWD's water resources,. (1) Conventional: Development of water resources (dams) - F/S of development of water resources - Conduct hydrogeological studies to sustain Metro Cebu's supply. (2) Unconventional: Efficient water use - NRW reduction, water demand management (reduction of consumption per capita, smart meter, etc.), and water reuse systems may be potential water source options. - Efficient use strategy of water sources - A conventional and unconventional water resources development and management plan need to be prepared to ensure sustainable future water sources in the long run. (3) Educational campaigns and community programs in Metro Cebu to encourage water conservation and watershed protection participation. 2. Strategic financing plan The development involves a strategic financing plan that includes debt procurement based on projected strong future cash flows, engagement with the private sector, and coordination with LWUA. Preparing a comprehensive long-term plan, encompassing water resource development and a financing strategy, as part of MCWD's 10-year plan, will be essential. Additionally, while internal funds are available, they have not been utilized for capital investments. To enhance capital investment, it will be critical to accumulate and effectively utilize internal financial resources alongside other funding sources.	

List of bottleneck analysis results and recommendations for improvement

	Issues	Diagnostics	Recommendations for improvement
Internal Factors			
1.	Management and finance		
	Issues with accounting consistency and transparency	The O&M cost coverage rate is 113% and the O&M cost coverage rate excluding grant is 110%. The difference is minimum because the grant/differed income) is not major income. The Philippine Water Supply and Sanitation Master Plan (PWSSMP) only clarify the gap between investment need and governmental funding. MCWD has 10-years plan, in which financial forecast is carried out.	To increase water supply facilities, capital investment is required but currently no government subsidy is available and less DP assistance. Also there is own fund but it is not utilized for capital investment. As a measure to increase capital investment, own financial sources will be more accumulated and utilized together with other financial sources. An investment plan will be prepared, based on which fund will be procured along with revenue enhancement measures including increase of tariff efficiency and NRW reduction to increase O&M cost coverage rate to 130% at least for further accumulation of own fund. - The development entails more strategic financing plan including debt procurement based on the future strong cash-flow, dialogue with the private sector, coordination with LWUA. Preparing a long-term plan including water resource development and financing plan, which may be included in 10 years' MCWD plan will be important. - In Japan, there is a history of the government using subsidies to develop facilities and to support local government bond issuance to raise funds. MCWD needs to learn how that works and introduce it in the Philippines. Regular tariff revisions are to be carried out.
	Low profitability	MCWD conducts an extensive cost recovery tariff analysis regularly. Water is supplied from private bulk suppliers (including groundwater, surface water, seawater and brackish water desalination) and purchased at 73 pesos/m3. The retail price is 24 pesos/m3, and the tariff revision submitted to LWUA in December 2022 is 40 pesos/m3 (not approved). However, the tariff revision has not yet been approved (the reason is unknown, but other water districts in the Philippines are in the same situation), and the same tariff has been used since 2015. MCWD has operating the utility by management efforts (efficiency) without tariff increase. The tariff is gradually increasing in blocks and is divided into three categories: residential, commercial, and industrial, but the tariffs are set at almost the same amount. We are considering cross-subsidy with a difference at the timing of the next tariff revision after the one that has been submitted and not yet approved.	
	Challenges in the process of setting tariff	No official data is available, but private water operators charge higher tariffs. Water tariff adjustments are applied as needed, typically every five years, as the Public Hearing validity period is five years (LWUA regulations need confirmation).	
	Insufficient planning and investment funding shortage		
2.	Service provision and maintenance		
	The water supply coverage ratio and the population served are not growing.	Very low water coverage rate at 32% (2023). Against a supply capacity of 250,000 m³/day, the water demand is 500,000 m³/day. The lack of permission from LGUs to occupy and excavate land is also a reason why water supply expansion is not progressing. While no official coverage data is available, it is estimated that only 3% of the population relies on piped water, while 65% use private wells as their primary water source. Groundwater quality deterioration is leading some users to seek MCWD connections.	There are possibly major 2 reasons for low service coverage: less investment fund and insufficient water resources. To increase water supply capacity, these 2 bottlenecks should be cleared. Furthermore, regulatory and political issues mentioned in the external factor should be solved. MCWD plans to increase the service coverage from 31% to 50% in 2028 and 70% in 2033, which will be attended by sustainable water resources. NRW reduction and water demand management may be potential water source options. A conventional and unconventional water resources development and management plan need to be prepared to ensure sustainable future water sources in the long run. Reduction of NRW and leakage will supplement water sources in addition to improve financial conditions. At first NRW situation assessment is required for next steps.
	Insufficient infrastructure development	The NRW rate is high at 34.68% (first quarter of 2024). Main causes are inaccurate meters and illegal connections. There is room for consideration of demand management using smart meters as a future solution to water shortages, but this should be done after the target water supply coverage rate is achieved and DMA is completed. Leakage due to aged pipeline. 93% of NRW is leakage and the rest is basically measurement error. Theft is not that much. However, 93% is a little bit overestimated.	
	High non-revenue water (NRW) rate	Underground leak detection remains a major challenge. Measures such as the construction of DMA by MCWD are being implemented. As challenges for NRW measures, however, the effectiveness of these measures is unknown and there are issues such as the construction of DMA, the renewal of aging pipes (budget request is being made), and the unknown locations of old valve installations. High distribution pressure contributes high leakage.	
	High leakage rate	Water supply time is 21 hours, which is an issue (2021)	
	Insufficient maintenance of facilities	There are plans to establish 267 DMAs, with 60 already established. The government is seeking to raise funds to prioritize establishing DMAs in the Mactan Area or Cebu. Not all 60 DMAs are monitored due to break-down of instrument such UPS. MCWD intends to repair them. Before 2020, NRW was 23%, with a minimum of 19%. However, the typhoon in December 2021 caused water supply to be cut off (and electricity to be cut off), and residents seeking water destroyed water facilities. This caused the NRW rate to rise to a maximum of 42%. Currently, the government is working to lower the increased NRW.	
	Water outage and unstable supply	O&M issues include budget, high RO purchase price, small leak detection team (6-7 people), contamination of groundwater sources, power outages, and pipeline maintenance. Water percapita per day(domestic) is 156L. According to the Philippine Institute for Development Studies, an average Filipino person consumes between 48 to 108 liters of water per day(I). ·The SCADA provided by JICA under a grant is not currently being used	
	No DX utilization and low operational efficiency	because functions cannot be added later and data transmission is not working properly due to failures in the RTU and inverters. 20 of the 53 slave units (pumping stations, water reservoirs, etc.) are in operation. A budget will be allocated to purchase parts and put them back into use. · Currently, only SCADA provided by a private bulk supplier is in use. However, this is to certify that the required standards (amount of water sold to MCWD, water quality) stated in the off-take agreement are being met and is not used to monitor and control the entire system.	
3.	Commercial Operations		
	Low customer satisfaction	Based on comments from the 2021 Customer Satisfaction Survey, the following issues have been identified as challenges from 2022 onwards: Immediate response to complaints such as low water pressure, water shortages, water contamination and Odor, and immediate repair of water leaks. Timely distribution of water bill invoices and prevention of delays or non-delivery. Timely dissemination of information regarding water outages and other service updates. Although the collection rate is 80% indicating that the operational capability is	

	Issues	Diagnostics	Recommendations for improvement
	Low collection rate	Although the collection rate is 60%, indicating that the operational capacity is relatively high, the collection of accounts receivable is delayed.	
4.	Organization and Human Resource Management		
	Shortage of engineers and skills gap	Small leak detection team (6-7 people). There is training need (Request from MCWD to JICA Philippine office in Dec 2024. The training centre is under construction but the training program has not been prepared in advance. The General Manager is appointed by LWUA. There has been controversy surrounding the dismissal of board members. The top management issue may affect utility's operation. (Cebu City Government, 1 February 2024)	
	Reducing organizational efficiency		
	Lack of strategic management capabilities in the organization		
	Lack of planning		
	Governance issues		

	Issues	Diagnostics	Recommendations for improvement
External factors			
5.	Environment (Water Sources)		
	Depletion of water sources and deterioration of water quality	·Water source shortage is problematic. The composition of water sources of MCWD is 19% surface water, 49% groundwater, and 31% desalinated water (as of answers to questionnaire). Of the groundwater recharge volume of 370,000 cubic meters per day, 60% is pumped by private wells. ·In most cities, the groundwater balance is predicted to be negative by 2050 in response to water demand, with a particularly large negative groundwater balance trend in the Metro Cebu region." In addition to the inability to increase the available groundwater volume due to easy development permits for private business well drilling, customers are not being effectively acquired. If regulations can be strengthened, it is expected that these customers can be acquired and the available volume (from MCWD's perspective) can be increased. Due to the easy development permits for private business well drilling, the available groundwater volume cannot be increased, and customers are not being effectively acquired. ·Although MCWD has been dependent on groundwater for water sources, it is now attempting to move away from this dependency by utilizing surface water and purchasing from private companies (desalinated seawater). ·Due to the impact of the El Niño phenomenon, water sources are depleting, and water supply is decreasing. ·In Cebu Island, issues such as the lowering of dam water levels during droughts and the infiltration of saltwater into groundwater have become apparent, making water resource problems an urgent issue. There are many commercial facilities with wells in the water supply area, but they are becoming depleted due to the progression of groundwater salinization, and requests for connection are increasing. ·Groundwater is becoming saline due to excessive pumping, and is contaminated with nitrates from pesticides and faeces. In addition, pumping is exceeding the amount of recharge, leaving almost no room for future development. The groundwater has no potential due to increasing salinity and nitrate pollution. The MCWD's 10-years plan envisages the development of surface water (river), which is located far from Cebu Metropolitan area, along with the use of seawater desalination. Since NWRB has no branch office in Cebu, water source developers must travel to the Manila headquarters to apply. Permits are issued without assessing the impact on existing water rights holders, such as MCWD, who rely on the same groundwater sources	A comprehensive plan for water resource development for sources of water supply considering climate change. The plan may include conventional and unconventional water resources such as NRW reduction, demand management and desalination. Based on the plan, the capital investment plan for water source development will be prepared followed by preparation of water supply facility plan.
6.	Government systems and		
	Tariff policy issues	The internal reserves are being used for short-term investments, not for facility expansion. Investment is necessary first, which requires a water tariff increase. Reducing NRW is essential for operational efficiency and increased revenue. Facility optimization is needed, as Piso Water Treatment Plant remains non-operational (by JICA team). It is an old facility (100 years) and is either unused or has an insufficient water source. Financing remains a challenge, as obtaining a national loan involves complex procedures. Direct funding to MCWD is needed. The Development Bank of the Philippines offers an interest rate of 3.9%, and the role of NEDA (National Economic and Development Authority) is unclear.	It may be reassured to clear how much influenced by regulatory and political issues on utility operation. It may need to clear the bottleneck that self-funding cannot be invested in facility expansion and water source development and facility expansion cannot be financed through debt. Upper management instability may affect utility operation. Stable upper management may be ensured.
	Hindering self-sustaining operations	Without any national/grant funding, MCWD has to proceed with facility development using only own funds/loans. Therefore, we need financial assistance from DPs, but since loan/grant projects through the central government take a very long time, we believe that direct funding to MCWD is necessary. LWUA has a performance contract, but is not implementing it due to a lack of incentives. The appointing authority for BOD is the mayor of Cebu City (largest local government supplied by MCWD), by which there is political influence.	
	Challenges in Water Supply Policy	Private operators receive commercial operation permits from LGUs, rather than LWUA approval, resulting in different licensing requirements. A legal precedent ruled against MCWD, stating that MCWD does not have priority in supplying unserved areas. Decisions should be made considering public welfare. Regulatory fragmentation is a major issue due to the lack of a unified water governance body within the government. There is a plan to establish a Department of Water within the Ministry, which is currently under Congress review. This initiative is crucial as multiple agencies, including LWUA (Presidential Office), DENR, and NWRB, require coordination, highlighting the need for a centralized regulatory body.	
7.	Development Partner Support		
	Lack of development partner support	Past Projects: ADB: Although a plan for water supply and sanitation infrastructure development until 2030 was formulated through the technical assistance "Urban Water Supply and Sanitation Project" (2011-2014), the Philippine Department of Finance did not approve the loan for MCWD's distribution pipe expansion project based on this plan. Sector loans were implemented through LWUA, and funding was (Not?) provided to MCWD.	The reason why government did not approve the loan for distribution pipe extension project may be confirmed for preparation of further improvement measures.
8.	Socioeconomics and Finance		

	Issues	Diagnostics	Recommendations for improvement
	Socioeconomic Impact	According to the news, regarding the management of MCWD, the Mayor of Cebu and the Chairman of MCWD have been in conflict since around May 2023. The Mayor is pursuing the dismissal of the Chairman due to mismanagement of MCWD, while the Chairman is opposing, claiming that the Mayor aims to privatize MCWD. As of October 2024, this political issue is still ongoing. (Source: Cebu City, <i>Deposed MCWD directors told: Stop interfering in water district affairs</i>, February 26, 2024) Among the recent challenges to improve water supply services, political issues are cited as the primary concern (followed by financial issues and government agencies).	It is not sure how political issue affects the utility's operation.
	Lack of financial resources	There is a policy finance mechanism by LUWA but it seems not working well for MCWD since financing to MCWD has not been approved by LUWA. Funding by DPs and government subsidies are insignificant for MCWD. Borrowing from commercial banks is not permitted, and fund-raising options are limited to borrowing from government banks (Land Bank of Philippines, Development Bank of Philippines, LWUA), borrowing from donors, and bond issuance. However, since there have been no cases of bond issuance in the Philippines to date, guidelines need to be established. In addition, LWUA's lending conditions are poor (low interest, lending funds borrowed from DP at about 8%), and there is a limit to the amount LWUA itself can lend, so it has almost no lending capacity, so in reality it is not seen as a borrower.	

4. Diagnostics based on Growth Spiral (GS diag)

Overall diagnostics of growth spiral

The service coverage ratio has remained at a low level of around 30% over the past four years. The spiral from 1 to 2 is not working well. The spiral from 2 to 3 is working but revenue increase is minimal. Overall financial results are in an up and down trend and not enough for major investment with own fund, but retained earning is increasing. The spiral from 3 to 4 is not working. The spiral from 4 to 1 is not working well. This may be the critical point to increase capital investment to boost the facility capacity followed by increase of service coverage and water sales. High Non-Revenue Water (NRW), especially leakage, is deteriorating profitability and hindering the effective use of limited water resources.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?

Diagnosis result	The number of connections has slightly increased, and the water sold has also increased especially in 2023. However, the service coverage ratio has remained at a low level (31% to 32%). The spiral from 1 to 2 seems not working well. However, high customer satisfaction is remarkable.				

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
1	Investment cash out (000')	238,147,604	-	→	
2	Production capacity (m/day)	276,058	-	↗	3, 7
3	Production (m/day)	275,993	-	↗	3, 7
4	Utilization ratio of production capacity (%)	100	-	-	
5	Continuity of Service (Hrs/day)	22	2	→	
6	Quality of water supplied (Compliance rate: %)	100	4	-	
7	Water supply pressure (% of 24/7 supply of water)	NA	-	-	
8	Leakage ratio (%)	32	-	↘	

(4→1) Is the financial improvement leading to investment activities?

Diagnosis result	Although the net profit and EBITDA are on a slight decline, the retained earnings have accumulated significantly, accounting for about 60% of the balance sheet. Additionally, the interest-bearing debt ratio is only 5% of the total asset. Over the past three fiscal years, there has been zero financial cash inflow, and investment cash outflow has been at an annual depreciation level, leading low facility expansion. Despite generating profits, there is a state of being unable or unwilling to invest in expansion or increasing customers. Overall, investment is not made. The spiral from 4 to 1 is not working well. This may be the critical point to increase capital investment to boost the facility capacity followed by service coverage and water sales increase. Aged infrastructure needs to be renewed				

Legend

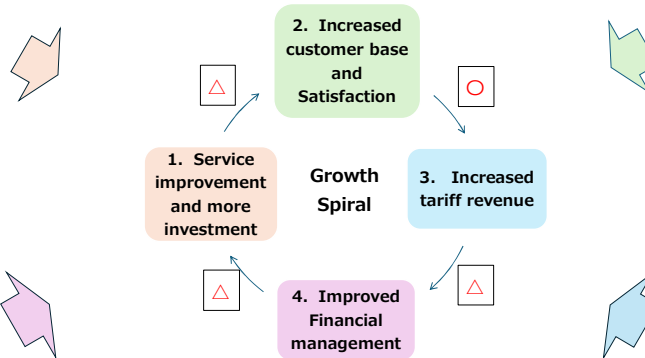
- Working well
- Working
- △ Not working well

Note:

The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
9	Population served / connections	205,882	-	↗	4
10	Service coverage / Water coverage (%)	32	1	→	4
11	Customer satisfaction (%)	93	3	-	
12	Water sold (m/day)	183,271	-	↗	2, 4
13	Water consumption per capita per day (L/c.a/day) - (Water sold)/(connection*family size)	209	-	-	1

Note: Customer satisfaction in 2021



KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
19	Accounting system	NA	0	-	
20	Net income (000')	48,521,215	-	↗	2, 6
21	EBITDA (000')	247,786,435	-	Updown	2, 6
22	EBITDA margin (%)	12.1	2	Updown	2, 6
23	EBITDA margin excluding deferred income (000')	11.8	2	Updown	2, 6
24	Total capital operating margin (%)	0.9	-	→	
25	Ordinary profit margin (%)	2.9	2	→	
26	Equity ratio (%)	71.9	3	→	
27	Fixed long term conformity rate (%)	67.2	3	→	
28	O&M coverage ratio (%)	114.2	2	→	2, 6 USD
29	O&M coverage ratio excluding subsidies (%)	113.4	2	→	2, 6
30	Unit Cost of Water Supply (Currency/m³)	30	-	-	0.52
31	Supply Price (Currency/m³)	31	-	-	0.53
32	Subsidies (000')	5,642,701	-	↘	
33	Development Partner grant support (000')	NA	-	-	
34	The ratio of subsidies and DP support to turnover (%)	0.003	-	→	
35	Number of staff per 1,000 connections	4.2	4	→	

1PHP 0.0173 USD

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?

Diagnosis result	The tariff collection ratio is around 80%, which is a basic level and leaves room for improvement. The spiral from 2 to 3 seems working but revenue increase is very minimal.				

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
14	Turnover	2,055,967,702	-	↗	2, 5
15	Collection ratio (%)	81	2	→	1
16	Non-Revenue Water ratio(%)	33	2	↘	1
17	Metering ratio (%)	100	4	→	
18	Water tariff level (6m3/month/household, local currency)	NA	-	-	1

(3→4) Is the tariff revenue improvement leading to financial improvement?

Diagnosis result	There are no subsidies or grants for revenue compensation, and operations are conducted entirely on a self-sustaining basis. NRW is over 30%, and maintenance and repair costs account for 57% of the operating and maintenance (O&M) costs, indicating the possibility of facility aging. The O&M coverage ratio without subsidies is 113%, which indicates that O&M cost is covered by sales but not enough for capital investment. Financial indicators are in an up and down trend in recent years. The human resources efficiency is high as indicated less number of staff per 1,000 connections. Overall, financial results are in a up and down trend, possibly but retained earning is increasing. The spiral from 3 to 4 seems not working possibly due to increasing high NRW.				

5. Strategy analysis

Medium- to long-term direction of the water utility

1. Vision and Mission

(1) Vision: MCWD envisions itself to be a **progressive viable utility firm that provides adequate, safe, potable and affordable water** and an effective sewerage system for Metro Cebu.

(2) Mission: The tasks in following mission statements must be accompanied by **sound and prudent financial management** with the overriding goal of providing better services to the people of Metro Cebu.

- We are committed to undertake continuing exploration and development activities, aimed at **the preservation and sustainability of our water resources**.
- Our capability to **provide proper services must continuously improve by designing and managing the growth of infrastructure** in an innovative, timely, safe and cost-effective manner.
- We shall operate and maintain our facilities in an optimal manner, making total quality an integral part of our performance.
- It is then indispensable to nurture a **highly-motivated workforce**, with a strong collaboration, deeply committed to professionalism, and firmly focused on productivity.
- The workforce shall be **upheld and inspired by a competent management team** dedicated to the common good of MCWD.

2. Legal framework

The creation of MCWD followed a year after President Ferdinand Marcos signed into law Presidential Decree 198, also known as the Provincial Water Utilities Act of 1973, authorizing legislative bodies to enact resolutions forming water districts. On November 20, 1974, the Local Water Utilities Administration (LWUA) granted MCWD its Certificate of Conformance, officially sealing its creation and existence.

3. Corporate Plan

The latest publication from MCWD is annual report 2022. In the report, General Manager mentions the following short-term objectives:

At present, MCWD has 204,109 service connections that consume approximately 178,000 m3 and aim to serve an additional 14,000 service connections to 198,000 m3/day. Currently, we are implementing our **water sourcing strategies that will bring in 460,000 m3/day with ongoing proposals for desalination and surface water** already in progress. The Board of Directors and Management are going the extra mile by requesting Congress to fund some, if not all, of the requirements, with an estimated amount of Php 4.2 billion in the five-year capital expenditure program of MCWD. MCWD's **NRW stands at around 31%, and we are determined to decrease it to 28% by the end of 2023**. To achieve this target, we will be focusing our efforts on reducing physical losses by continually implementing programs such as meter maintenance, and monitoring of LGU extractions. These initiatives will be regularly carried throughout the year.

4. Others

The LWUA has recommended that **NRW be kept below 20%**.

5. Request of assistance by answer to questionnaire by JICA Team

Infrastructure: Water and Wastewater treatment systems, Expansion and distribution lines.

Capacity Development: NRW, Wastewater treatment, Digital Twinning Technologies/ Advance metering system, and Risk Mitigation

10-year business plan (2032)

	in 2032	Remarks
Population served	1,400,403	Total population in 2032: 3,136,707
Served population coverage	45%	
Water demand coverage	62%	
Number of Connections	382,539	
Target NRW	20%	32.75 in 2022, 26.5% in 2025
Average Consumption per Connection	35 m3/month/connection	27 m3/month in 2022
Proposed tariff rate increase	60% in 2023, 60% in 2025, 10% in 2028,	
Total water supply volume	429,584m3/day	250,697 m3/day in 2022
- In house	168,704 m3/day	157,667 m3/day in 2022
- Bulk water supply	260,880 m3/day	93,030 m3/day in 2022

Recommendations for improvement

Overall Goal:

"Progressive and economically viable utility provides adequate, safe, potable, and affordable water system for Metro Cebu"

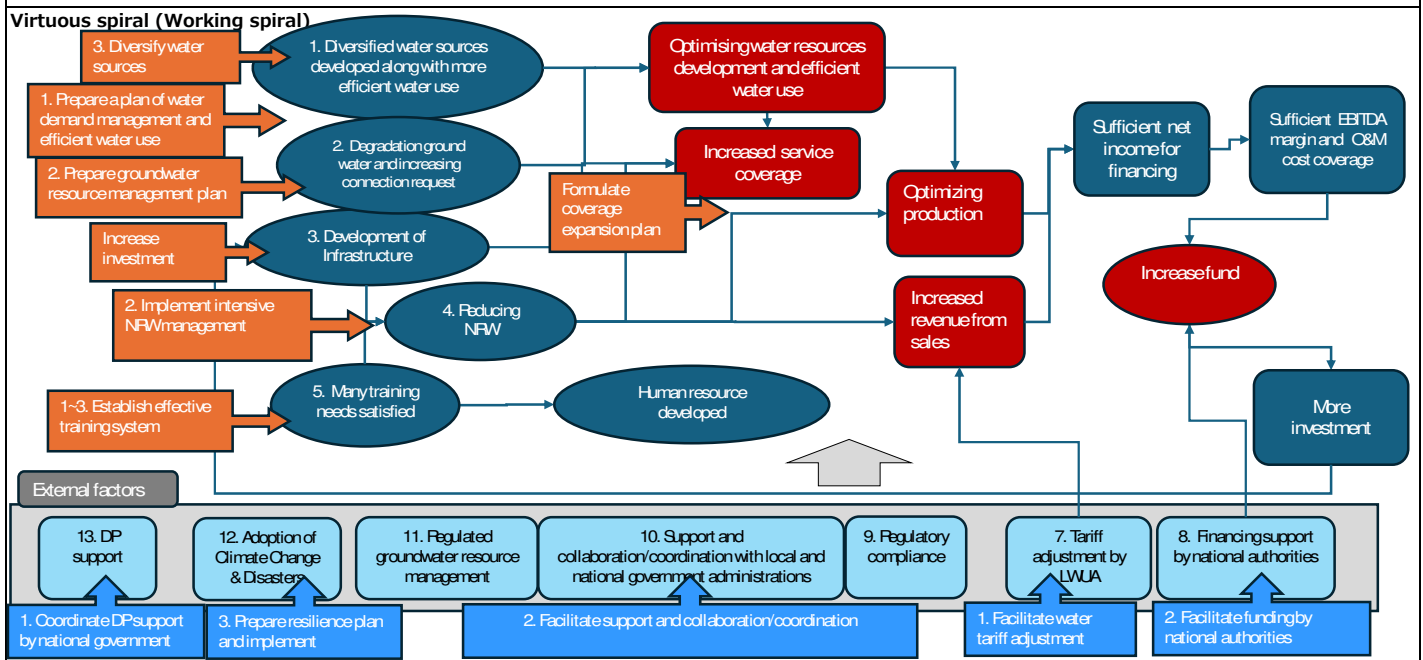
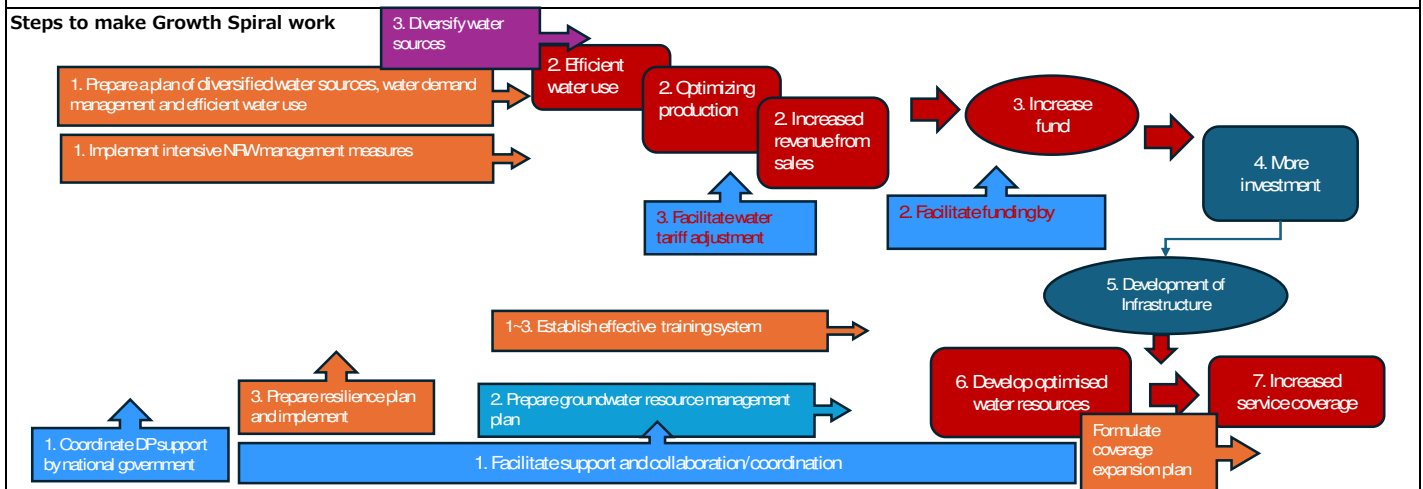
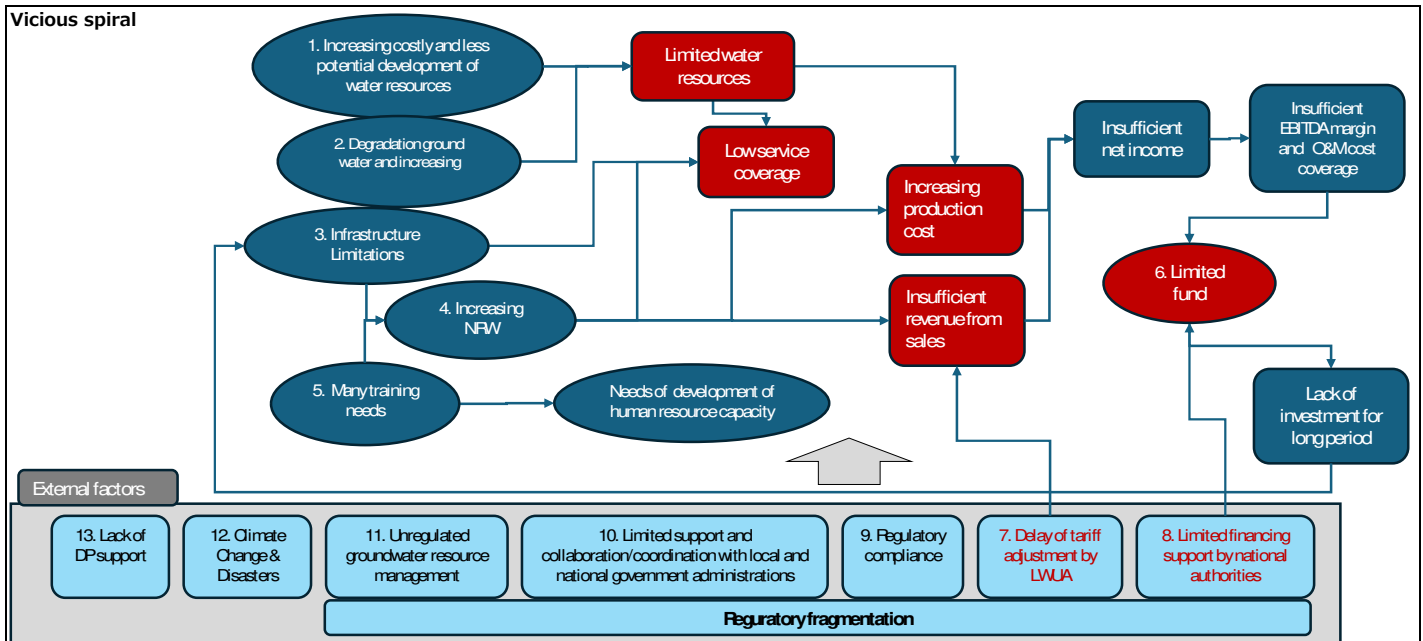
This overall goal aligns with NWSC's vision, along with the mission statements which are interpreted as :

- Sound and prudent financial management
- Preservation and sustainability of our water resources.
- Designing and managing the growth of infrastructure
- A highly-motivated workforce
- A competent management team

Mid-Term Goal:

"MCWD expands service coverage by developing and efficiently managing water supply sources and demand, while strengthening self-funding capacity with regulatory and political support."

There may be interconnecting challenges and bottlenecks for increase of service coverage including water source development and management, infrastructure investment for pipelines, operational efficiency including high NRW. For overcoming these bottlenecks and paving the way for the utility's growth and resilience, more regulatory and political supports will be necessary. The key to turning the spiral is to increased support by regulatory and political bodies, which will lead to increase of finance and investment for development of water sources, increase of customers and decrease NRW.



6. Potential Solutions

Goals

Overall Goal	Progressive and economically viable utility provides adequate, safe, potable, and affordable water system for Metro Cebu
Mid-term Goal	MCWD expands service coverage by developing and efficiently managing water supply sources and demand, while strengthening self-funding capacity with regulatory and political support

Outcomes

	Outcomes	Current DPs support /Own input	Indicator	Target		
				Base line in 2024	2030	Long-term
1	A water supply management plan based on water resources management, diversified water sources, water demand management and efficient water use is formulated and implemented.		Implementation progress	no comprehensive plan	plan developed	implemented
2	An intensive NRW management measures are implemented based on infrastructure updated and capacity development.		NRW (%)	34	20	20
3	Ground water resource management plan is prepared and implemented.		Implementation progress	no plan	plan developed and implemented	implemented
4	Water sources management is optimized and developed based on the water supply management plan formulated.		Water source amount developed (m3/d) Water source saved by more efficient use (m3/d)			
5	Coverage expansion is implemented based on coverage expansion plan prepared by MCWD.		Demand covered (%) Population served (%)	34.9 29	55.1 43	63.3 45 (2032)
6	An effective training system is implemented using completed training centre.		Implementation progress			

External actions

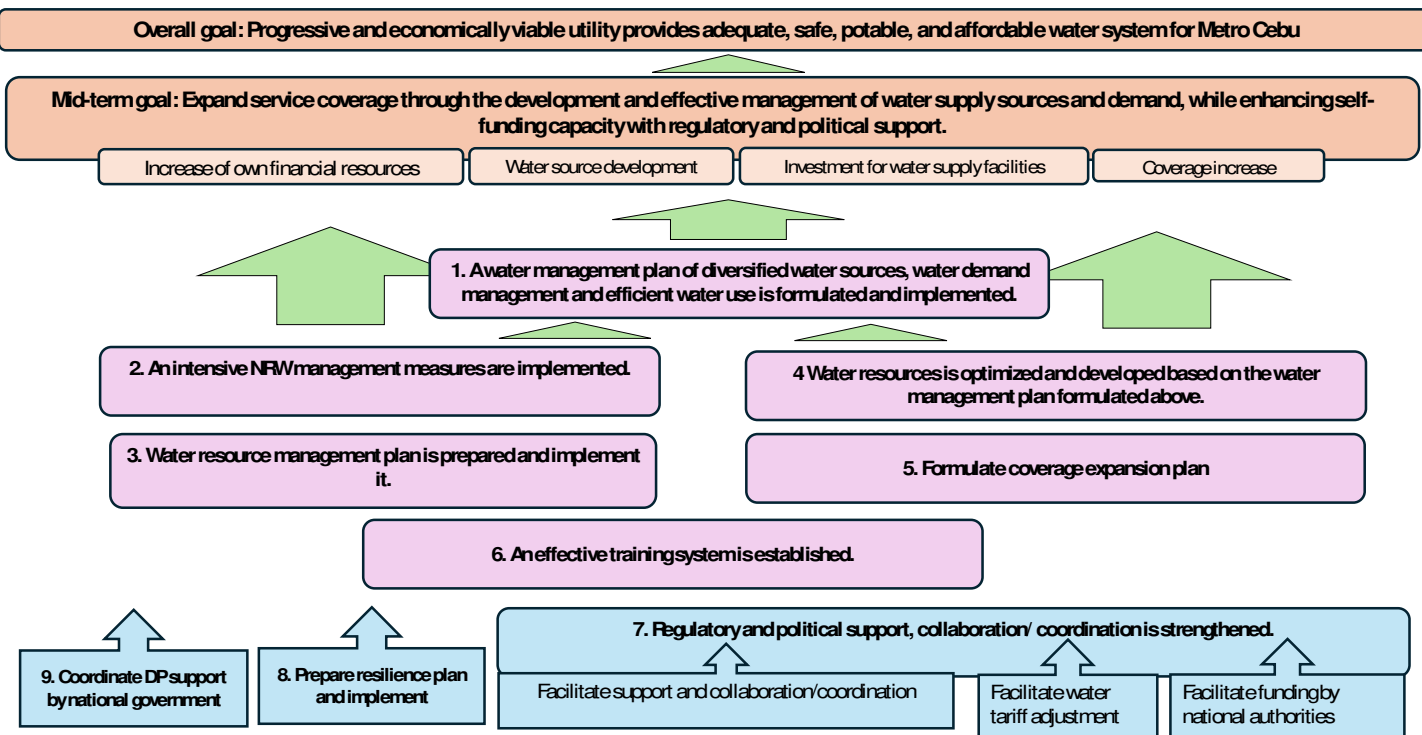
7	Regulatory and political support, collaboration/ coordination is strengthened. - Facilitate water tariff adjustment - Facilitate funding by national authorities - Facilitate support and collaboration/coordination with local and national government administrations		Capacity of water production (m3/day)			
8	Prepare water supply resilience plan along with a water supply management plan.					
9	Coordinate DP support by national government					

Activities

Activities		Current DPs support	Target	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030
1	A water supply management plan based on water resources management, diversified water sources, water demand management and efficient water use is formulated and implemented.								
	a Assess current water sources, water demand situation, potential sources and efficient water use measures		Short						
	b Develop a long-term, climate-resilient water supply source plan to meet future demand, including both conventional and unconventional water sources such as NRW reduction, recycled water, desalination, demand management, incorporating cost-benefit analysis		Mid						
	c Implement the water management plan	-	Long						
2	An intensive NRW management measures are implemented based on infrastructure updated and capacity development.								
	a Formulate NRW management plan including infrastructure and capacity building measures		Short						
	b Strengthen the capacity for NRW management (training) based on DMA management - Pilot project based on existing DMAs for capacity development		Mid						
	c Replace aging transmission and distribution pipelines with restructured zoning and modern technology (SCADA)		Long						
3	Ground water resource management plan is prepared and implemented.								
	a Implement hydraulic study of ground water		Short						
	b Understand groundwater use in Metropolitan Cebu		Mid						
	c Formulate groundwater resource management plan		Long						
4	Water sources management is optimized and developed based on the water supply management plan formulated.								
	a Develop a long-term, climate-resilient water supply source plan to meet future demand, including both conventional water resources and unconventional water sources such as NRW reduction, recycled water, reverse osmosis (RO), demand management.		Short						
	b Prepare a mid- and long-term financing plan for water source development and NRW reduction, leveraging LWUA/DBP loans, donor funding, or bulk water offtake agreement		Mid						
	c Implement the formulated plan		Long						
5	Coverage expansion is implemented based on coverage expansion plan prepared by MCWD.								
	a Understand private water supply areas and unserved areas, their needs of MCWD water supply		Mid						
	c Formulate transmission and distribution pipeline plan and implement		Mid						
	d Formulate management and O&M plan in expansion areas.	-	Long						
6	An effective training system is implemented using completed training centre.								
	a Assess the needs of training / capacity development		Short						
	b Establish training management system		Mid						
	c Prepare training programs and implement with priority	-	Long						

External factors (with the ministry)									
7	Regulatory and political support, collaboration/ coordination is strengthened. - Facilitate water tariff adjustment - Facilitate funding by national authorities - Facilitate support and collaboration/coordination with local and national government administrations								
	a Identify the areas, approaches, and measures of collaboration with LWUA, DENR, DPWH, NWRB, LGUs for improving water supply service and performance		Urgent						
	b Enhance collaboration with LWUA, DENR, DPWH, NWRB, and LGUs		Mid						
8	Prepare water supply resilience plan along with a water supply management plan.								
1	Assess water supply conditions in past droughts, flooding, and typhoons, reducing water availability and damaging infrastructure								
	2 Prepare a climate resilience and adaptation plan								
	3								
9	Coordinate DP support by national government								

Scenario of Improvement



3a. Bottleneck analysis

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
	1	Management and finance			
		Accounting consistency and transparency issues			
		Financial statements are made not on the accrual basis of accounting.	☒	☐	
		There is no fixed assets register for financial management	☒	☐	
		Low profitability			
		The water revenue is insufficient to recover O&M costs.	☒	☐	The O&M cost coverage rate is 113% and the O&M cost coverage rate excluding grant is 110%. The difference is minimum because the grant/deferred income) is not major income.
		The water revenue is insufficient for full-cost recovery including investment cost	☐	☒	
		Unit price of water supply is low	☐	☒	Unit price is 0.53USD/m3-sold water, which is not high.
		Unit cost of water supply is high	☒	☐	Unit cost is 0.52USD/m3-sold water. Which is also not high.
		Process for setting water tariff is not in place			
		Water tariff is not reviewed on a regular basis	☒	☐	MCWD conducts an extensive cost recovery tariff analysis regularly. Water is supplied from private bulk suppliers (including groundwater, surface water, seawater and brackish water desalination) and purchased at 73 pesos/m3. The retail price is 24 pesos/m3, and the tariff revision submitted to LWUA in December 2022 is 40 pesos/m3 (not approved). However, the tariff revision has not yet been approved (the reason is unknown, but other water districts in the Philippines are in the same situation), and the same tariff has been used since 2015. MCWD has operating the utility by management efforts (efficiency) without tariff increase. The tariff is gradually increasing in blocks and is divided into three categories: residential, commercial, and industrial, but the tariffs are set at almost the same amount. We are considering cross-subsidy with a difference at the timing of the next tariff revision after the one that has been submitted and not yet approved. Tariff revisions are to be carried out every five years.No official data is available, but private water operators charge higher tariffs. Water tariff adjustments are applied as needed, typically every five years, as the Public Hearing validity period is five years (LWUA regulations need confirmation). A single tariff increase can be up to 60%.
		Water tariff is not revised in response to increases in operating costs such as inflation	☐	☒	
		Insufficient planning and investment funding shortage			
		No business operation plan and facility development plan have been prepared.	☒	☐	MCWD has the business plan. MCWD priority area for investment are: - Water resource development, network expansion, and rehabilitation of existing facilities.
		No financial projection of short to long term funds	☒	☐	The Philippine Water Supply and Sanitation Master Plan (PWSSMP) only clarify the gap between investment need and governmental funding. MCWD has 10-years plan, in which financial forecast is carried out. Financial forecasting is conducted for short-term, medium-term, and long- term needs regularly. The 10-year plan calls for expansion to 70% in 10 years (50% in 5 years) by 2033. This will require an investment of 4 billion pesos.
		High reliance on external funding such as subsidies in multi-year business plans	☒	☐	Almost no external fund.
	2	Service provision and maintenance issues			
		The water supply coverage ratio and the population served are not growing.			
		The water supply coverage rate and the population served are not growing.	☐	☒	Very low water coverage rate at 32% (2023). The lack of permission from LGUs to occupy and excavate land is also a reason why water supply expansion is not progressing. The 10-year plan includes an expansion strategy to increase water coverage. Private operators fall into two categories: (1) those using self-supplied groundwater wells and (2) those developing small-scale distribution networks from wells. Only 5–7 operators exist, all very small in scale. While no official coverage data is available, it is estimated that only 3% of the population relies on piped water, while 65% use private wells as their primary water source. Groundwater quality deterioration is leading some users to seek MCWD connections. In large-scale cases, such as San Miguel, groundwater is becoming saline, prompting requests for MCWD connections as an additional water source. However, most private water sources are small-scale wells.
		Insufficient infrastructure development			
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☐	☒	Against a supply capacity of 250,000 m ³ /day, the water demand is 500,000 m ³ /day.
		Development of new facilities is not progressing	☐	☒	Less investment for water supply facilities.
		There is a lot of aging infrastructure	☐	☒	As challenges for NRW measures, there are issues such as the construction of DMA, the renewal of aging pipes (budget request is being made), and the unknown locations of old valve installations.
		High non-revenue water (NRW) rate			
		Water balance not calculated	☐	☒	NRW is calculated based on water balance table by WB. There are plans to establish 267 DMAs, with 60 already established. The government is seeking to raise funds to prioritize establishing DMAs in the Mactan Area or Cebu. Not all 60 DMAs are monitored due to break-down of instrument such UPS. MCWD intends to repair them. Before 2020, NRW was 23%, with a minimum of 19%. However, the typhoon in December 2021 caused water supply to be cut off (and electricity to be cut off), and residents seeking water destroyed water facilities. This caused the rate to rise to a maximum of 42%. Currently, the government is working to lower the increased non-revenue water.The proportion of physical losses (leakage) accounts for 95%, while commercial losses make up 5%; however, further verification is needed. Currently, 20 DMAs are operational with installed flow meters. While most DMAs have an NRW rate below 20%, a few (2–3 DMAs) have significantly higher NRW rates.
	High commercial loss	☐	☒	Main causes are inaccurate meters and illegal connections. There is room for consideration of demand management using smart meters as a future solution to water shortages, but this should be done after the target water supply coverage rate is achieved and DMA is completed (through meeting).	
	There is no specialized department for managing non-revenue water.	☒	☐	MCWD has a specialized department.	
	There is no plan to reduce non-revenue water, and no measures have been implemented.	☒	☐	The NRW ratio is high at 34.68% (first quarter of 2024). MCWD has a NRW plan.	

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
Internal Factors		High leakage rate			
		Many leaks are caused by deterioration of water pipes	☐	☒	Leakage due to aged pipeline. 93% of NRW is leakage and the rest is basically measurement error. Theft is not that much. However, 93% is a little bit overestimated. Pipeline renewal is managed under Asset Management, with replacement prioritized based on the following criteria: (1) leakage occurrence, (2) pipe age, (3) pipe material, and (4) location (high NRW areas). Underground leak detection remains a major challenge. DMA zoning should follow a hierarchical structure, first dividing zones by LGUs, then into subdivisions, and finally into DMAs. The NRW target for this year is 31%.
		Leak detection is not being carried out systematically	☒	☐	MCWD is implementing all measures on NRW.
		Water pressure distribution is not controlled	☐	☒	Leakage due to high distribution pressure
		Insufficient maintenance			
		There is no up-to-date facility inventory for facility O&M	☐	☐	
		Regular maintenance of equipment is not carried out	☐	☐	O&M issues include budget, high RO purchase price, small leak detection team (6-7 people), contamination of groundwater sources, power outages, and pipeline maintenance.
		No budgeted maintenance plan	☐	☐	
		Water outage and unstable supply	☐	☐	
		Water supply infrastructure capacity is insufficient (gap between demand forecast and facility capacity)	☐	☒	Water supply is 250,000m3/day, while water demand is 500,000m3/d in Metropolitan area. Water per capita per day(domestic) is 156L. According to the Philippine Institute for Development Studies, an average Filipino person consumes between 48 to 108 liters of water per day(I).
		Water supply volume and quality are unstable (condition of water intake source)	☐	☒	Water supply time is 21 hours, which is an issue (2021) ·The Water Safety Plan (WSP) recommended by WHO was created in 2009, and the validity of the plan and the implementation status are being verified and reviewed.
		No DX implementation and low operational efficiency			
		There is no strategy for implementing digital transformation	☐	☐	
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases, smart meters)	☒	☒	·The SCADA provided by JICA under a grant is not currently being used because functions cannot be added later and data transmission is not working properly due to failures in the RTU and inverters. 20 of the 53 slave units (pumping stations, water reservoirs, etc.) are in operation. A budget will be allocated to purchase parts and put them back into use. · Currently, only SCADA provided by a private bulk supplier is in use. However, this is to certify that the required standards (amount of water sold to MCWD, water quality) stated in the off-take agreement are being met and is not used to monitor and control the entire system. ·GIS is in use, and hydraulic analysis of the pipeline is performed using Epanet. ·Each department has its own designated GIS and database, and the entered data can be integrated and viewed. Monthly reports are created using the GIS.
	3	Commercial Operations			
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☐	☐	
		There is no established process for handling complaints, or there are problems with handling complaints	☐	☒	·Although there is a complaint handling process, based on customer comments from the 2021 Customer Satisfaction Survey, the following issues have been identified as challenges from 2022 onwards: Immediate response to complaints such as low water pressure, water shortages, water contamination and odor, and immediate repair of water leaks. Timely distribution of water bill invoices and prevention of delays or non-delivery. Timely dissemination of information regarding water outages and other service updates. These complaints are continued in 2023/24 according to the answer to questionnaire by JICA. ·The MCWD website handles complaints.
		Low collection ratio			
		The water tariff collection process (including unpaid charges) is not effective/efficient	☐	☒	Manual reading and manual distribution of water bill. Although the collection rate is 80%, indicating that the operational capability is relatively high, the collection of accounts receivable is delayed.
		The payment method is inconvenient for customers (customers have some complaints)	☐	☐	Walk in. Gcash/ online payment. Deputized partners and payment Centers. Need improved online payment system, and Deputized more payment centers.
	4	Organization and Human Resource Management Issues			
		Shortage of engineers and skills gap			
		There is a shortage of engineers with specialized knowledge	☐	☒	Small leak detection team (6-7 people),
		No skills and training strategy or plan	☐	☒	There is training need (Request from MCWD to JICA Philippine office. .
		Regular training and development programs are not provided adequately.	☐	☒	The training center is under construction but the training program has not been prepared in advance.
		Declining organizational efficiency			
		There is no annual evaluation and goal setting system for staff	☒	☐	
		Performance-based rewards and promotions are not implemented in the personnel system	☒	☐	
		No power to hire and fire staff (within the bounds of an agreed plan)	☒	☐	
		Lack of strategic management capabilities in the organization			
		Not setting and monitoring enough Key Performance Indicators	☒	☐	
		Specific targets and deadlines associated with each strategic objective are not clearly defined.	☒	☐	
		There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☒	☐	
		Governance issues			

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Important decision-making processes are not clear and are not made in a collegial manner.	☒	☐	The General Manager is appointed by BOD.
		The division of responsibilities within the organization is not clear.	☒	☐	There has been controversy surrounding the dismissal of board members, and there is unstable human resources management at the top. The top management issue may affect utility's operation.(Cebu City Government, 1 February 2024)
External factors	5	Environment (Water Sources)			
		Depletion of water sources and deterioration of water quality			
		Water sources are unstable (there is no stable water source)	☐	☒	Water source shortage is problematic. The composition of water sources of MCWD is 19% surface water, 49% groundwater, and 31% desalinated water (as of answers to questionnaire). Of the groundwater recharge volume of 370,000 m3/day, 60% is pumped by private wells. In most cities, the groundwater balance is predicted to be negative by 2050 in response to water demand, with a particularly large negative groundwater balance trend in the Metro Cebu region. There is a plan to develop a surface water source from Bohol Province, but compliance with regulations is challenging, and LGU approval is difficult. LGU involvement is essential for project success. Since it involves long-distance water conveyance, the project is only viable if the water volume is large. In contrast, RO (Reverse Osmosis) systems can be cost-effective even with smaller water volumes. Other potential water sources within Cebu Island include Tobran (60 km) and Bajan (100 km).
		Water sources are over-exploited (unsustainable)	☒	☒	In addition to the inability to increase the available groundwater volume due to easy development permits for private business well drilling, customers are not being effectively acquired. If regulations can be strengthened, it is expected that these customers can be acquired and the available volume (from MCWD's perspective) can be increased. Due to the easy development permits for private business well drilling, the available groundwater volume cannot be increased, and customers are not being effectively acquired. Although MCWD has been dependent on groundwater for water sources, it is now attempting to move away from this dependency by utilizing surface water and purchasing from private companies (desalinated seawater). There are many commercial facilities with wells in the water supply area, but they are becoming depleted due to the progression of groundwater salinization, and requests for connection are increasing. Since NWRB has no branch office in Cebu, water source developers must travel to the Manila headquarters to apply. Permits are issued without assessing the impact on existing water rights holders such as MCWD, who rely on the same groundwater sources.
		Water sources are affected by pollution and climate change	☐	☒	- Groundwater is becoming saline due to excessive pumping, and is contaminated with nitrates from pesticides and faeces. In addition, pumping is exceeding the amount of recharge, leaving almost no room for future development. - Due to the impact of the El Niño phenomenon, water sources are depleting, and water supply is decreasing. - In Cebu Island, issues such as the lowering of dam water levels during droughts and the infiltration of saltwater into groundwater have become apparent, making water resource problems an urgent issue. - In recent years, flood damage caused by heavy rain has been expanding, and landslides have also occurred.
	6	Government systems and politics			
		Tariff policy issues			
		No medium- to long-term basic policy for the country's water sector exists	☒	☐	The Philippine Water Supply and Sanitation Master Plan (PWSSMP) is a national action plan is from 2017 to 2030.
		The purpose of the subsidy is unclear	☐	☒	MCWD receives grants for capital expenditure while it also make "Financial Assistance to Local Government Units." There is no subsidy from government.
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☐	☐	Financing remains a challenge, as obtaining a national loan involves complex procedures. Direct funding to MCWD is needed. The Development Bank of the Philippines offers an interest rate of 3.9%, and the role of NEDA (National Economic and Development Authority) is unclear. Investment is necessary first, which requires a water tariff increase. Reducing NRW is essential for operational efficiency and increased revenue. Facility optimization is needed, as Piso Water Treatment Plant remains non-operational (by JICA team). It is an old facility (100 years) and is either unused or has an insufficient water source.
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc.).	☐	☒	The internal reserves are being used for short-term investments, not for facility expansion.
		Regulation of water utilities does not function properly	☐	☒	Regarding surplus funds, they are invested as short-term investments in institutions like the Development Bank of the Philippines. There may be regulatory issues why self-funding cannot be invested in facility expansion and why water source development and facility expansion cannot be financed through debt. Without any national/grant funding, MCWD has to proceed with facility development using only own funds/loans. Therefore, we need financial assistance from DPs, but since loan/grant projects through the central government take a very long time, we believe that direct funding to MCWD is necessary. LUWA has a performance contract, but is not implementing it due to a lack of incentives. Private operators receive commercial operation permits from LGUs, rather than LWUA approval, resulting in different licensing requirements. A legal precedent ruled against MCWD, stating that MCWD does not have priority in supplying unserved areas. Decisions should be made considering public welfare. Regulatory fragmentation is a major issue due to the lack of a unified water governance body within the government. There is a plan to establish a Department of Water within the Ministry, which is currently under Congress review. This initiative is crucial as multiple agencies, including LWUA (Presidential Office), DENR, and NWRB, require coordination, highlighting the need for a centralized regulatory body. Its implementation is crucial, as coordination among multiple agencies is necessary. ~~A unified water authority is essential to address fragmented regulations effectively.~~
		The utility does not have the power to make personnel decisions	☐	☒	The appointing authority for BOD is the mayor of Cebu City (largest local government supplied by MCWD), by which there is political influence. See Socio-economic impact. There is some political
	7	Development Partner (DP) Support			

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☒	☐	VEI: A Dutch company, VEI, which supports water utilities in developing countries, implemented a project (2015-2022) to expand water supply areas targeting the impoverished population (80,000 people goal), flood and typhoon countermeasures, and business and financial management support. However, the effectiveness of the project and subsequent support are unknown.
		There is no continues donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☐	☒	There is an upcoming sewerage development support project. Ongoing Grant Aid Project: JICA: From September 2024, a 36-month technical cooperation project "Comprehensive Master Plan Formulation Project for Sewerage Development" is planned. This includes support for strengthening the planning capacity related to MCWD's sewage management plan and organizing funding methods. Past Projects: -ADB: Although a plan for water supply and sanitation infrastructure development until 2030 was formulated through the technical assistance "Urban Water Supply and Sanitation Project" (2011-2014), the Philippine Department of Finance did not approve the loan for MCWD's distribution pipe expansion project based on this plan. Sector loans were implemented through LWUA, and funding was also provided to MCWD. -JICA: National Water Resources Development and Management Information Collection and Verification Survey. In this survey, a water balance assessment for each water resource area was conducted nationwide in the Philippines, targeting the year 2050. Regarding Metro Cebu region, Cebu Island faces urgent water resource issues, including declining dam levels during droughts and saltwater infiltration into groundwater. By 2050, most cities, especially Metro Cebu, are expected to have a negative groundwater balance. Proposed measures include strengthening non-revenue water measures, promoting water-saving activities, and investigating the placement, scale, and costs of new dams in Cebu and Bohol. (source: JICA) Septage Treatment Facility - JICA Grant The only DP support other than that from JICA was from the Netherlands for the extension of the pipeline and leak detection (2012-2018).
		No continued donor support for capacity development projects	☐	☒	JICA: Capacity Development on wastewater treatment programs and NRW Programs.
	8	Socioeconomic and finance			
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate fluctuations, etc.)	☒	☐	The average inflation rate was 5.98% in 2023.
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☐	☒	Regarding the management of MCWD, the Mayor of Cebu and the Chairman of MCWD have been in conflict. The Mayor is pursuing the dismissal of the MCWD Chairman.*2 Among the recent challenges to improve water supply services, political issues are cited as the primary concern (followed by financial issues and government agencies).
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☐	☒	The central bank's lending rate is 6.50% October 2024. There is a government funding mechanism but it may be not worked for MCWD. Funding by DPs and government subsidies are less. Borrowing from commercial banks is not permitted, and fund-raising options are limited to borrowing from government banks (Land Bank of Philippines, Development Bank of Philippines, LWUA), borrowing from donors, and bond issuance. However, since there have been no cases of bond issuance in the Philippines to date, guidelines need to be established. In addition, LWUA's lending conditions are poor (low interest, lending funds borrowed from DP at about 8%), and there is a limit to the amount LWUA itself can lend, so it has almost no lending capacity, so in reality it is not seen as

Source

※ 1

Cebu City Government, 1 February 2024, Case filed vs. deposed MCWD directors for 'usurpation' retrieved on 6 November, 2024 from <https://cebucity.news/2024/02/01/case-filed-vs-deposed-mcwd-directors-for-usurpation/>

2

Metropolitan Cebu Water District, 10 October, 2024, Mayor Garcia appoints new MCWD BOD member, retrieved on 6 November from https://www.mcwd.gov.ph/ords/production/r/mcwd-website/news?p55_news_selected=&clear=55&session=2281596678709

0. Benchmark

Major Categories	Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
					1	2	3	4
Water service	Service level	Service Improvement and Investment Activities	1	Investment cash out (000')	–	–	–	–
			2	Production capacity (m ³ /day)	–	–	–	–
			3	Production (m ³ /day)	–	–	–	–
			4	Utilization ratio of production capacity (%)	–	–	–	–
			5	Continuity of Service (Hrs/day)	Below 12h/d	12-24h/d	24h/d	–
			6	Quality of water supplied (Compliance rate: %)	Untreated/muddy water	Compliance rate below 80%	Compliance rate 80% or more	Compliance rate 90% or more
			7	Water supply pressure (% of 24/7 supply of water)	Low water pressure	Unstable	Stable and within standard values	–
			8	Leakage ratio (%)	–	–	–	–
	Business scale	Customer Increase and Trust	9	Population served / connections				
			10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
			11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	–
			12	Water sold (m ³ /day)	–	–	–	–
			13	Water consumption per capita per day (L/c.a/day) - (Water sold)/(connection*family size)	–	–	–	–
Management	Cost-effectiveness	Water Tariff Profitability Improvement	14	Turnover				
			15	Collection ratio (%)	60% or less	60-90%	Aim for 100%	100%
			16	Non-Revenue Water ratio(%)	40% or more	25-40%	Below 25%	15%
			17	Metering ratio (%)	80% or less	80-95%	Aim for 100%	100%
			18	Water tariff level (6m ³ /month/household, local currency)	–	–	Aim for a level of sustainable investment	–
	Prerequisites	Management and Financial Improvement	19	Accounting system	–	–	Aim for Public Enterprise Accounting	–
			20	Net income (000')	–	–	–	–
	21		EBITDA (000')	–	–	–	–	
	22		EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	–	
	23		EBITDA margin excluding deferred income (000')	Negative	0%-40%	Aim for 40% or more	–	
	24		Total capital operating margin (%)	–	–	–	–	
	25		Ordinary profit margin (%)	–	8% or less	Aim for 10% or more	–	
	26		Equity ratio (%)	–	30% or less	Aim for 40% or more	–	
	27		Fixed long term conformity rate (%)	–	Above 100%	Aim for less 100%	–	
	28		O&M coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	–	
	29		O&M coverage ratio (%)	Less than 100	100-130	Above 130	–	
	30		Unit Cost of Water Supply (Currency/m ³)	–	–	–	–	
	31		Supply Price (Currency/m ³)	–	–	–	–	
			Overall cost excluding depreciation expense	–	–	–	–	
			Overall cost including depreciation expense	–	–	–	–	
	32		Subsidies (000')	–	–	–	–	
	33		Development Partner grant support (000')	–	–	–	–	
	34		The ratio of subsidies and DP support to turnover (%)	–	–	–	–	
	Human Resource Efficiency			35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5

CONDENSED STATEMENT OF COMPREHENSIVE INCOME

	Note	2020/12	2021/12	2022/12	2023/12	YoY
Service and Business Income	21	1,748,284,383	1,793,903,962	1,819,623,452	2,055,967,702.23	1%
Sewerage/Garbage Fees			32,058,857	32,160,314	34,454,250.68	
Business Income			1,761,845,105	1,787,463,138	2,021,513,451.55	
Shares, Grants and Donations	21	68,604,718	68,604,718	34,044,621	5,642,701.03	-50%
Other Non-Operating Income	21	2,484,719	17,455,621	10,710,984	9,918,252.60	-39%
Total Income		1,819,373,820	1,879,964,301	1,864,379,056	2,071,528,655.86	-1%
Personnel Services	22	590,639,531	584,939,490	589,819,177	646,754,700.39	1%
Maintenance and Other Operating Expenses	23	885,097,409	1,014,057,658	1,055,812,195	1,166,496,766.41	4%
Financial Expenses	24	20,621,125	13,054,113	11,686,769	11,846,993.21	-10%
Non-Cash Expenses	25	234,604,412	220,351,464	181,222,891	187,181,533.62	-18%
Total Expenses		1,730,962,477	1,832,402,726	1,838,541,032	2,012,279,993.63	0%
Profit Before Tax		88,411,343	47,561,575	25,838,024	59,248,662.23	-46%
Income Tax Expense/(Benefit)		450,068	(3,003,725)	(107,261)	(236,693.30)	-96%
Profit After Tax		87,691,275	44,557,850	25,730,763	59,011,968.93	-42%
Net Assistance / Subsidy / (Financial Assistance/Subsidy/Contribution)	26	(11,073,158.00)	(10,285,537)	(10,445,559)	(10,490,753.90)	2%
Net Income		76,888,117	34,272,313	15,285,205	48,521,215.03	-55%
Other Comprehensive Income/(Loss) for the Period		-	-	-	-	#DIV/0!
Comprehensive Income/(Loss)		76,888,117	34,272,313	15,285,205	48,521,215	-55%

21指標⑥	EBITDA	331,663,586	270,681,616	208,302,126	247,786,435	-23%
21指標⑦	EBITDA Margin	18.23%	14.40%	11.17%	11.96%	-22%
	EBITDA Margin excluding subsidy	15.03%	11.16%	9.52%	11.72%	-15%
21指標⑧	ROA (Net income/total asset)	1.48%	0.66%	0.29%	0.86%	-56%
21指標⑨	Ordinary profit margin(Profit Before Tax/Total income)	4.86%	2.53%	1.39%	2.86%	-45.2%
	Operating cost (excluding depreciation)	1,475,736,940	1,598,997,148	1,645,631,372	1,813,251,467	
	Operating cost recovery excluding subsidy (%)	118.5%	112.2%	110.6%	113.4%	
	Operating cost recovery (%)	123.3%	117.6%	113.3%	114.2%	
	Overall cost excluding depreciation expense excluding finance cost	1,475,736,940	1,598,997,148	1,645,631,372	1,813,251,467	
	Overall cost including depreciation expense excluding finance cost	1,710,341,352	1,819,348,612	1,826,854,263	2,000,433,000	
	Labor and staff costs vs Operating costs	40.0%	36.6%	35.8%	35.7%	
	(Labor and staff costs)/(Operating costs)					

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

Assessment of Benefits of NRW Reduction (NRW reduction Benefit - Case 1)						
Current NRW is 34.9% (Physical 17.5% and non-physical 17.5%)						
1 Reduced NRW is 25% (Physical loss 12.5% and non-physical loss 12.5%)						
2 Reducing non-physical water losses directly increases revenue.						
3 Reducing physical water losses lowers variable costs such as pump						
Financial benefits assuming reduction of NRW						
Actual	Total Water Produced	(m3/day)	216,572	234,395	251,560	275,993
Actual	Production	(m3/annual)	79,048,780	85,554,175	91,819,400	100,737,445
Actual	Water sold (Revenue water)	(m3/annual)	59,144,297	59,845,145	61,822,002	67,111,286
Actual	NRW ratio	(%)	25.2%	30.1%	32.7%	33.4%
Assumed	NRW ratio by physical loss	(%)	23%	27%	29%	30%
Assumed	NRW ratio by non-physical loss	(%)	3%	3%	3%	3%
Calculated	NRW by physical loss	(m3/annual)	17,914,035	23,138,127	26,997,658	30,263,543
Calculated	NRW by non-physical loss	(m3/annual)	1,990,448	2,570,903	2,999,740	3,362,616
Calculated	NRW total	(m3/annual)	19,904,483	25,709,030	29,997,398	33,626,159
Assumed	Target NRW ratio (%)	(%)	20%	20%	20%	20%
Assumed	Assumed NRW ratio by physical loss	(%)	18%	18%	18%	18%
Assumed	Assumed NRW ratio by non-physical loss	(%)	2%	2%	2%	2%
Calculated	NRW by physical loss	(m3/annual)	14,228,780	15,399,752	16,527,492	18,132,740
Calculated	NRW by non-physical loss	(m3/annual)	1,580,976	1,711,084	1,836,388	2,014,749
Calculated	Water saved from NRW reduction by physical loss	(m3/annual)	3,685,254	7,738,375	10,470,166	12,130,803
Calculated	Water saved from NRW reduction by non-physical loss	(m3/annual)	409,473	859,819	1,163,352	1,347,867
Calculated	Water saved from total NRW reduction	(m3/annual)	4,094,727	8,598,195	11,633,518	13,478,670
Unit cost and unit tariff rate (Php/m3)						
Calculated	Unit cost (All expenses/sold water volume)	(Php/m3)	29	31	30	30
Calculated	Unit cost (Expenses exclude depreciation and financial costs/sold water volume)	(Php/m3)	25	27	27	27
Calculated	Unit cost (Variable costs/sold water volume)	(Php/m3)	15	17	17	17
Calculated	Unit price (Service and Business Income/sold water volume)	(Php/m3)	30	30	29	31
Saved cost and increased sales (Php/year)						
Calculated	Costs saved by NRW reduction by physical loss	(Php/year)	55,150,015	131,124,396	178,812,215	210,851,907
Calculated	Revenue generated from NRW reduction by non-physical loss	(Php/year)	12,103,867	25,773,745	34,241,243	41,292,176
Calculated	Total revenue increased and costs saved by NRW reduction	(Php/year)	67,253,882	156,898,141	213,053,459	252,144,084
Calculated	Revenue generated from total NRW reduction	(Php/year)	121,038,668	257,737,453	342,412,433	412,921,763
Total calculated income and expenditure (Php/year)						
Calculated	Total Income	(Php/year)	1,831,477,687	1,905,738,046	1,898,620,300	2,112,820,832
Calculated	Total expenditure before Depreciation	(Php/year)	1,420,586,925	1,467,872,752	1,466,819,157	1,602,399,560
Calculated profits (Php/year)						
Calculated	Operating Profit Before Depreciation	(Php/year)	410,890,762	437,865,294	431,801,143	510,421,273
Calculated	Operating profits before finance costs	(Php/year)	390,269,637	424,811,181	420,114,374	498,574,279
Calculated	Net (Loss) Profit Before Tax	(Php/year)	369,648,512	411,757,067	408,427,604	486,727,286
Calculated	Net income (loss) for the year	(Php/year)	369,198,444	414,760,792	408,534,865	486,963,979
Calculated	Comprehensive income (loss) after Net Assistance / Subsidy / (Financial Assistance/Subsidy/Contribution)		358,125,286	404,475,255	398,089,307	476,473,226
Calculated	Water saving	(m3/day)	10,097	21,201	28,685	33,235
Note: Variable costs are assumed as Maintenance and Other Operating Expenses.						

Note: Variable costs are assumed as Maintenance and Other Operating Expenses.

Financial indicators assuming NRW reduction (25%)					
	EBITDA	410,890,762	437,865,294	431,801,143	510,421,273
	EBITDA Margin	22%	23%	23%	24%
	EBITDA Margin(excluding deferred income)	22%	23%	23%	24%
	O&M coverage ratio (excluding deferred income)	129%	130%	129%	132%
	O&M coverage ratio(including all income)	129%	130%	129%	132%
	ROA (Operating profit/asset)	10.1%	10.7%	10.6%	12.5%
	Ordinary profit margin	20%	22%	22%	23%

Financial indicators assuming NRW reduction (Original)					
	EBITDA	331,663,586	270,681,616	208,302,126	247,786,435
	EBITDA Margin	18%	14%	11%	12%
	EBITDA Margin(excluding deferred income)	15%	11%	10%	12%
	O&M coverage ratio (excluding deferred income)	118%	112%	111%	113%
	O&M coverage ratio(including all income)	123%	118%	113%	114%
	ROA (Operating profit/asset)	1.5%	0.7%	0.3%	0.9%
	Ordinary profit margin	4.9%	2.5%	1.4%	2.9%

2. Sale increase by entire NRW reduction volume

Currency =USD

0.0178

CONDENSED STATEMENT OF COMPREHENSIVE INCOME						
	Note	2020/12	2021/12	2022/12	2023/12	YoY
Service and Business Income	21	1,748,284,383	1,793,903,962	1,819,623,452	2,055,967,702.23	1%
Sewerage/Garbage Fees			32,058,857	32,160,314	34,454,250.68	
Business Income			1,761,845,105	1,787,463,138	2,021,513,451.55	
Shares, Grants and Donations	21	68,604,718	68,604,718	34,044,621	5,642,701.03	-50%
Other Non-Operating Income	21	2,484,719	17,455,621	10,710,984	9,918,252.60	-39%
Total Income		1,819,373,820	1,879,964,301	1,864,379,056	2,071,528,655.86	-1%
Personnel Services	22	590,639,531	584,939,490	589,819,177	646,754,700.39	1%
Maintenance and Other Operating Expenses	23	885,097,409	1,014,057,658	1,055,812,195	1,166,496,766.41	4%
Financial Expenses	24	20,621,125	13,054,113	11,686,769	11,846,993.21	-10%
Non-Cash Expenses	25	234,604,412	220,351,464	181,222,891	187,181,533.62	-18%
Total Expenses		1,730,962,477	1,832,402,726	1,838,541,032	2,012,279,993.63	0%
Profit Before Tax		88,411,343	47,561,575	25,838,024	59,248,662.23	-46%
Income Tax Expense/(Benefit)		450,068	(3,003,725)	(107,261)	(236,693.30)	-96%
Profit After Tax		87,691,275	44,557,850	25,730,763	59,011,968.93	-42%
Net Assistance / Subsidy / (Financial Assistance/Subsidy/Contribution)	26	(11,073,158.00)	(10,285,537)	(10,445,559)	(10,490,753.90)	2%
Net Income		76,888,117	34,272,313	15,285,205	48,521,215.03	-55%
Other Comprehensive Income/(Loss) for the Period		-	-	-	-	#DIV/0!
Comprehensive Income/(Loss)		76,888,117	34,272,313	15,285,205	48,521,215	-55%

21指標⑥	EBITDA	331,663,586	270,681,616	208,302,126	247,786,435	-23%
21指標⑦	EBITDA Margin	18.23%	14.40%	11.17%	11.96%	-22%
	EBITDA Margin excluding subsidy	15.03%	11.16%	9.52%	11.72%	-15%
21指標⑧	ROA (Net income/total asset)	1.48%	0.66%	0.29%	0.86%	-56%
21指標⑨	Ordinary profit margin(Profit Before Tax/Total income)	4.86%	2.53%	1.39%	2.86%	-45.2%
	Operating cost (excluding depreciation)	1,475,736,940	1,598,997,148	1,645,631,372	1,813,251,467	
	Operating cost recovery excluding subsidy (%)	118.5%	112.2%	110.6%	113.4%	
	Operating cost recovery (%)	123.3%	117.6%	113.3%	114.2%	
	Overall cost excluding depreciation expense excluding finance cost	1,475,736,940	1,598,997,148	1,645,631,372	1,813,251,467	
	Overall cost including depreciation expense excluding finance cost	1,710,341,352	1,819,348,612	1,826,854,263	2,000,433,000	
	Labor and staff costs vs Operating costs	40.0%	36.6%	35.8%	35.7%	
	(Labor and staff costs)/(Operating costs)					

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 2)

1	Current NRW is 34.9% (Physical 17.5% and non-physical 17.5%)
	Reduced NRW is 25% (Physical loss 12.5% and non-physical loss 12.5%)
2	Reducing both physical and non-physical water losses leads to

Financial benefits assuming reduction of NRW						Compositi on of NRW
Actual	Total Water Produced	(m3/day)	216,572	234,395	251,560	275,993
Actual	Production	(m3/annual)	79,048,780	85,554,175	91,819,400	100,737,445
Actual	Water sold (Revenue water)	(m3/annual)	59,144,297	59,845,145	61,822,002	67,111,286
Actual	NRW ratio	(%)	25.2%	30.1%	32.7%	33.4%
Assumed	NRW ratio by physical loss	(%)	23%	27%	29%	30%
Assumed	NRW ratio by non-physical loss	(%)	3%	3%	3%	3%
Calculated	NRW by physical loss	(m3/annual)	17,914,035	23,138,127	26,997,658	30,263,543
Calculated	NRW by non-physical loss	(m3/annual)	1,990,448	2,570,903	2,999,740	3,362,616
Calculated	NRW total	(m3/annual)	19,904,483	25,709,030	29,997,398	33,626,159
Assumed	Target NRW ratio (%)	(%)	20%	20%	20%	20%
Assumed	Assumed NRW ratio by physical loss	(%)	18%	18%	18%	18%
Assumed	Assumed NRW ratio by non-physical loss	(%)	2%	2%	2%	2%
Calculated	NRW by physical loss	(m3/annual)	14,228,780	15,399,752	16,527,492	18,132,740
Calculated	NRW by non-physical loss	(m3/annual)	1,580,976	1,711,084	1,836,388	2,014,749
Calculated	Water saved from NRW reduction by physical loss	(m3/annual)	3,685,254	7,738,375	10,470,166	12,130,803
Calculated	Water saved from NRW reduction by non-physical loss	(m3/annual)	409,473	859,819	1,163,352	1,347,867
Calculated	Water saved from total NRW reduction	(m3/annual)	4,094,727	8,598,195	11,633,518	13,478,670
Unit cost and unit tariff rate (Php/m3)						
Calculated	Unit cost (All expenses/sold water volume)	(Php/m3)	29	31	30	30
Calculated	Unit cost (Expenses exclude depreciation and financial costs/sold water volume)	(Php/m3)	25	27	27	27
Calculated	Unit cost (Variable costs/sold water volume)	(Php/m3)	15	17	17	17
Calculated	Unit price (Service and Business Income/sold water volume)	(Php/m3)	30	30	29	31
Saved cost and increased sales (Php/year)						
Calculated	Costs saved by NRW reduction by physical loss	(Php/year)	55,150,015	131,124,396	178,812,215	210,851,907
Calculated	Revenue generated from NRW reduction by non-physical loss	(Php/year)	12,103,867	25,773,745	34,241,243	41,292,176
Calculated	Total revenue increased and costs saved by NRW reduction	(Php/year)	67,253,882	156,898,141	213,053,459	252,144,084
Calculated	Revenue generated from total NRW reduction	(Php/year)	121,038,668	257,737,453	342,412,433	412,921,763
Total calculated income and expenditure (Php/year)						
Calculated	Total Income	(Php/year)	1,940,412,488	2,137,701,754	2,206,791,490	2,484,450,419
Calculated	Total expenditure before Depreciation	(Php/year)	1,475,736,940	1,598,997,148	1,645,631,372	1,813,251,467
Calculated profits (Php/year)						
Calculated	Operating Profit Before Depreciation	(Php/year)	464,675,548	538,704,606	561,160,118	671,198,952
Calculated	Operating profits before finance costs	(Php/year)	444,054,423	525,650,492	549,473,348	659,351,959
Calculated	Net (Loss) Profit Before Tax	(Php/year)	423,433,298	512,596,379	537,786,579	647,504,966
Calculated	Net income (loss) for the year	(Php/year)	422,983,230	515,600,104	537,893,840	647,741,659
Calculated	Comprehensive income (loss) after Net Assistance / Subsidy / (Financial Assistance/Subsidy/Contribution)		411,910,072	505,314,567	527,448,281	637,250,905
Calculated	Water saving	(m3/annual)	1,122	2,356	3,187	3,693

Note: Variable costs are assumed as Maintenance and Other Operating Expenses.

Financial Performance Indicators					
	EBITDA	464,675,548	538,704,606	561,160,118	671,198,952
	EBITDA Margin	24%	25%	25%	27%
	EBITDA Margin(excluding deferred income)	24%	25%	25%	27%
	O&M coverage ratio (excluding deferred income)	131%	134%	134%	137%
	O&M coverage ratio(including all income)	131%	134%	134%	137%
	ROA (Operating profit/asset)	11.4%	13.2%	13.7%	16.4%
	Ordinary profit margin	22%	24%	24%	26%

Financial indicators assuming NRW reduction (Original)					
	EBITDA	331,663,586	270,681,616	208,302,126	247,786,435
	EBITDA Margin	18%	14%	11%	12%
	EBITDA Margin(excluding deferred income)	15%	11%	10%	12%
	O&M coverage ratio (excluding deferred income)	118%	112%	111%	113%
	O&M coverage ratio(including all income)	123%	118%	113%	114%
	ROA (Operating profit/asset)	1.5%	0.7%	0.3%	0.9%
	Ordinary profit margin	4.9%	2.5%	1.4%	2.9%

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnosis and Potential Solutions -

Solomon Islands Water Authority (SIWA)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

S. Overall Summary

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
- 3a. Bottleneck analysis (details)
0. Benchmarks
- 7.1. PL-NRW1 (NRW reduction benefit- Case 1)
- 7.2. PL-NRW2 (NRW reduction benefit- Case 2)

S. Overall Summary of Diagnostics and Potential Solution

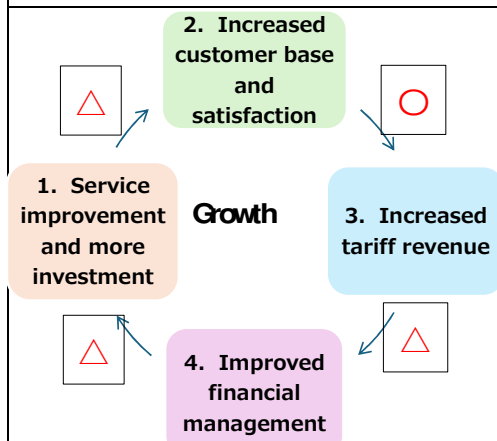
Utility name : Solomon Islands Water Authority (SIWA)

Summary of Growth Spiral diagnostics*1

Water services have improved, but the service coverage and financial situation have not improved much. Three spirals may be not working well but the increase in customers leading an increase in tariff revenue is working.

The trend in water production and continuity of service is positive, and the quality of water supplied is good, so it is considered that the water supply service is improving. However, service coverage is stagnant and customer satisfaction is potentially not high.

NRW is very high at around 60%. The high number of staff per 1,000 connections can lead to high labour costs. Although the turnover has increased slightly, the net profit is decreasing. The O&M cost coverage ratio excluding subsidies is not high (around 110%), which indicates insufficient own funds, and the utility cannot invest in major infrastructure from its own resources.



*1: Refer to "4.GS diag

Legend

- Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "3.Summary of bottleneck analysis"

Unknown Customer Satisfaction

SIWA receives around 1,000 monthly inquiries and complaints, primarily about leaks, outages, and billing issues. However, a comprehensive customer satisfaction surveys are not conducted, despite the CEO's focus on customer-centricity.

Illegal Connections Due to Strict Disconnection Policies

Approximately 85% of customers do not pay bills on time, leading to SBD 1 million in unpaid amounts. While stricter disconnections and prepaid meters have improved collection rates, disconnected customers likely resort to illegal connections. Outdated meters and malfunctioning prepaid systems further complicate the situation.

High Water Tariffs

Water tariffs have increased significantly, with minimum charges rising from 4.89 SBD in 2016 to over 9 SBD in 2024. These high charges, accounting for about 15% of household income, have led to more unpaid bills and theft. High non-revenue water (NRW) and energy costs exacerbate the financial strain.

High Non-Revenue Water (NRW)

NRW remains a major issue due to physical losses from aging pipelines (60% over 30 years old), commercial losses from illegal connections, and organizational challenges. The newly established NRW department needs a clear plan, adequate resources, and trained staff, while leak detection and monitoring systems are insufficient.

Limited Human Resource Development

Frequent staff turnover and insufficient training hinder SIWA's capacity development. SIWA relies heavily on donor-funded training programs to build capacity.

High Turbidity During Heavy Rain

Deforestation caused by commercial logging upstream leads to high turbidity in raw water during rainfall, resulting in frequent interruptions of water supply.

Collaboration with Stakeholders

To improve operations, SIWA may need to enhance collaboration with key stakeholders. Efforts include engaging with police to address illegal connections, coordinating with ministries to restore water sources, and working with MMERE to reduce energy costs for water supply sustainability.

Recommendations for Improvement

Refer to "5.Strategy analysis"

Mid-Term Goal:

"SIWA transforms into a financially self-sustained and customer oriented water utility through developed human resource and strengthened NRW management"

This customer-focused organizational transformation is a priority aligned with the Five-Year Corporate Strategic Plan and is foundational to make growth spiral of SIWA functional.

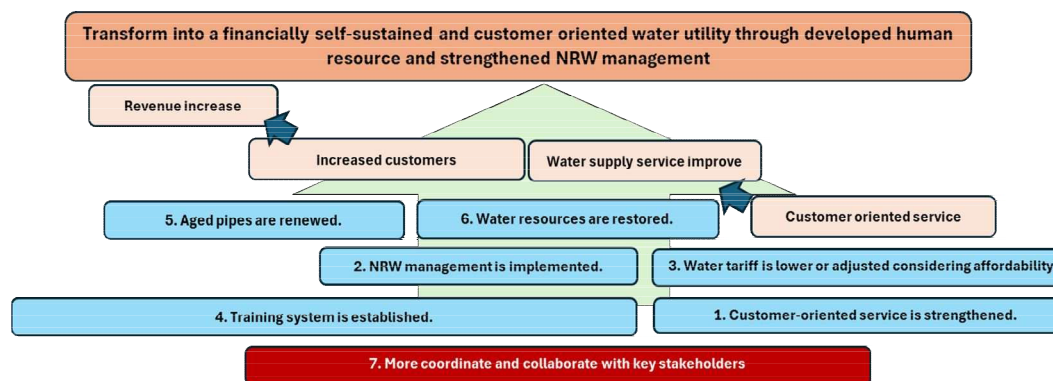
Customer satisfaction and needs will be assessed to prioritize improvement measures, forming the foundation for strengthening customer-oriented services. Measures to address illegal connections and improve meter management will be implemented in collaboration with the police. Comprehensive NRW management capacity will be enhanced, scaling up successful pilot projects conducted by JICA, and an NRW management plan will be developed and executed.

With an allocated investment budget, aging pipelines in high-leakage areas will be renewed. Throughout these initiatives, a more affordable water tariff structure will be established to reduce the financial burden on customers. To ensure the sustainability of these efforts, a robust training system will be implemented.

Additionally, water source areas will be effectively managed to improve water quality and minimize supply interruptions. Opportunities for enhanced coordination and collaboration with key stakeholders will be pursued to support these objectives.

Potential Solutions (Scenario for Improvement)

Refer to "6.Solution"



1. Diagnostics based on indicators (Index diag)

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Utility name: Solomon Water				Improvement trend	Stage of growth				Year				Source				Remarks (Additional information)	Initial diagnosis by indicator	
				KPI Values					1	2	3	4	1	2	3	4	1	2	3	4			
				2020	2021	2022	2023																
Service level	Service Improvement and Investment Activities	1	Investment cost (Currency)	55,011,410	35,811,005			-	-	-	-	-											
		2	Production capacity (m ³ /day)	45,913	44,171	46,580	47,965	↗	-	-	-	-											
		3	Production (m ³ /day)	34,263	34,960	34,979	36,885	↗	-	-	-	-	2020	2021	2022	2023					25,716(m ³ /d) (2005) *E 32,500(m ³ /d) (2015/16)*F	Large increase between 2022 and 2023	
		4	Utilization ratio of production capacity (%)	75	79	75	77	→	-	-	-	-											
		5	Continuity of Service (Hrs/day)	22.2	23.1	23.2	23.4	→	2	2	2	2	2020	2021	2022	2023	B	G	G	G		Increasing gradually	
		6	Quality of water supplied (Compliance rate: %) - The nums of samples complied/the nums of total samples of analysis per year	99.7	96.2	96.2	96.2	→	4	4	4	4	2020	2021	2022	2023	B	B	G	G			
		7	Water supply pressure (m)	Average 8m, 100m in some areas	Average 8m, 100m in some areas	Average 8m, 100m in some areas	Average 8m, 100m in some areas	→	-	-	-	-	2020	2021	2022	2023	B	B	G	G		Water pressure is high and low, exceeding 100 m in some places, and water pressure does not seem stable	
		8	Leakage ratio (%)	48	43	41	42	→	-	-	-	-										Leakage ratio is very high.	
Business scale	Customer Increase and Trust	9	Population served				65,000	↗	-	-	-	-				2023				D	Population served		
			Connections (domestics)	12,544	12,706	16,063	16,502																
			Connections (total)	13,872	13,990	17,520	18,007																
			Disconnection	998	1,509	2,126	3,815															5429 (in 2024)	
		10	Service coverage / Water coverage (%)	69	80	72	74	→	2	2	2	2	2020	2021	2022	2023						Decreasing gradually	
		11	Customer satisfaction (%)					→	NA	NA	NA	NA	2020	2021	2022	2023	B	G	G	G	(2021)customer complaints/1000 connections:127 mainly due to Cash water defects	Need to understand the customer satisfaction..	
		12	Water sold (m ³ /day)		16,112	14,205	14,797	→	-	-	-	-		2021	2022	2023		B	B	B	H	A little decrease form 2022.	
13	Water consumption per capita per day (L/c.a/day) - Total water sold/population served	#DIV/0!	#DIV/0!	#DIV/0!	227.6	-	-	-	-	-													
Cost-effectiveness	Water Tariff Profitability Improvement	14	Turnover - revenue from sales	98,257,235	118,679,205	120,709,376	132,725,843	↗	-	-	-	-	2020	2021	2022	2023						Increasing by 10%	
		15	Collection ratio (%) - bills collected /total billed	83 (reduced collection due to economic downturn)	84	90	96	↗	4	2	3	3	2020	2021	2022	2023	B	G	G	G		Increasing and good collection rate	
		16	Non-revenue water ratio(%)	59.0	60.0	60.0	60.0	→	1	1	1	1	2020	2021	2022	2023	B	G	G	G	NRW is averaged at 56.3% in February 2024, which was improved from 60.8% in August 2023. The average NRW for the greater Honiara area in February 2024 was 56.6%.*C		
		17	Metering ratio (%) - the meter installed customers/total customers	91.81	96.85	98	100	↗	2	3	3	4		2021	2022	2023		I	I	I	I		Increasing and high metering ratio
		18	Water tariff level		43.8	48.9	51.2	↗	-	-	-	-		2021	2022	2023		D	D	D	D	58.2 (2024)	The level has been increased and is quite high.
Prerequisites	Management and Financial Improvement	19	Accounting system	IFRS (Accrual basis)	IFRS (Accrual basis)	IFRS (Accrual basis)	IFRS (Accrual basis)	-	3	3	3	3	2020	2021				B	B			International standards.	
Profitability		20	Net income (Currency)	17,657,147	-7,164,777	9,939,042	6,865,781	↘	-	-	-	-	2020	2021				B	B			Positive net income except for 2021 and a decreasing trend	
		21	EBITDA (Currency)	30,958,173	13,832,245	26,374,816	26,481,426	→	-	-	-	-	2020	2021				B	B				
		22	EBITDA margin (%)	32	12	22	20	→	2	2	2	2	2020	2021				B	B				
		23	EBITDA margin excluding deferred income (%)	13	0.7	8	11	↗	2	2	2	2	2020	2021				B	B			Not sufficient to borrow investment fund, ideally more than 40%	
		24	Total capital operating margin (%)	6	-2	3	1	↘	-	-	-	-	2020	2021				B	B				
		25	Operating profit margin (%)	15	-5	7	5	↘	3	1	2	2	2020	2021				B	B				
Financial soundness		26	Equity ratio (%)	57	49	57	48	↘	3	3	3	3	2020	2021	2022	2023	B	G	G	G		Quite high, but the most is from evaluation surplus	
		27	Fixed long term conformity rate (%)	87	81	85	90	↗	3	3	3	3	2020	2021				B	B			Adequate	
		28	O&M cost coverage ratio (%)	134	110	121	121	→	3	2	2	2	2020	2021	2022	2023	B	G	G	G			
		29	O&M cost coverage ratio excluding subsidies (%)	113	99	106	111	↗	2	1	2	2	2020	2021				B	B			Generating minimum profit at least. Need higher to invest by own fund	
		30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	7.9	23.9	24.6	25.4	→	-	-	-	-	2020	2021				B	B				
		31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	#DIV/0!	20	23	25	→	-	-	-	-	2020	2021				B	B			Quite high	
			Overall cost excluding depreciation expense	87,083,359	120,272,396	114,198,211	119,749,628		-	-	-	-	2020	2021				B	B				
			Overall cost including depreciation expense	98,493,134	140,288,331	127,535,669	137,257,553		-	-	-	-	2020	2021				B	B				
		32	Subsidies (Currency)	10,551,440	9,745,857	4,100,000	165,218	↘	-	-	-	-	2020	2021				B	B				
		33	Development Partner grant support (Currency)	7,577,891	3,234,701	13,103,823	12,379,860	→	-	-	-	-	2020	2021				B	B				
		34	The ratio of subsidies and DP support to turnover	18.5	10.9	14.3	9.5	↘	-	-	-	-	2020	2021				B	B				
		HR efficiency	35	Number of staff per 1,000 connections	11.7	12	12	12	→	1	1	1	1	2020	2021	2022	2023	B	G	G	G		Quite high, ideally less than 5

	2020	2021	2022	2023					2020	2021	2022	2023
Inflation	2.96	-0.12	5.52	5.89	Solomon Islands Inflation Rate 1972-2025 MacroTrends							
	31/12/2020	31/12/2021	30/12/2022	28/12/2023								
Exchange rate	0.1230	0.1233	0.1203	0.1173	https://www.google.com/finance/quote/SBD-USD?window=5Y							
Difference		0%	-2%	-2%								

3 year average	3.8

Source

A
B
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IBNet
SW's Annual Report
[https://www.adb.org/projects/51271-001/main_\(see \"Project Data Sheet\"\)](https://www.adb.org/projects/51271-001/main_(see%20\)
<https://www.solomonwater.com.sb/index.php/about-us/our-history>
https://openicareport.jica.go.jp/pdf/11829371_06.pdf Preparatory Survey by JICA
30YearStrategicPlan-MainReport
Questionnaire response received on Nov 4, 2024
20240724 Attachment 1 Board Decision Paper Item 5.3 - SW Half-Yearly Report 1 January to 30 June 2024 - Final
Answer by SIWA in Nov 2024

2. Analysis based on financial statements (FS analysis)

Summary

SIWA generates a minimum profit, but largely depends on government and donor grant for capital investment. On the cost side, salaries and employee benefits expenses approximately account for 30%, which is relatively high. About the Balance sheet, evaluation surplus and deferred revenue(government and donor grant) accounts for its major part, and the retained earnings are limited. **Therefore, it is necessary to check what contributed to revenue-cost balance (such as NRW and staff cost) to ensure sustainable operation.**

Positive

- The revenue from customers has been increasing by 10% on average and profit is also upward in general.
- The Utility is investing in equipment within the scope of cash-in subsidies as it is highly dependent on subsidies. Particularly in the 2021-2023, grant money is invested in the utility and therefore the size of balance sheet doubled in the 2 years.
- The equity ratio is about 50%, indicating a high degree of financial stability.
- In 2022, the surplus of operating cash is also invested in acquisition of plant and equipment.

Negative

- The operating cost coverage ratio is 121%, but excluding subsidies, it is a relatively low level at 110%.
- Impairment loss, which is the loss of income due to unsuccessful collection accounts for 5-10% of total cost.
- Long-term subsidies from governments and donors are recorded as deferred revenue, accounting for about 47% of total assets. The company is highly dependent on subsidies for capital investment.
- The accounts receivable turnover is 152 days, which is much more than tariff collection cycle, 1 month.

Analysis

No.	Category	Analysis
1	Basic information	
	Accounting standards	Accrual accounting with depreciation has been introduced.
	Comments by auditor	An error in the accounting method for the accounting of the Grants has been pointed out and the corresponding accounts have been corrected in the BS and PL.
2	P/L	
	Profitability	•From 2020 to 2023, the revenue from customers has been increasing by 10% on average as a result on continuous tariff increase but the expenses just made a small fluctuation during the 4 years. Each year impairment loss, which is the loss of income due to unsuccessful collection accounts for 5-10% of total cost.
	Revenues Composition	•About 90% of total revenues are accounted for by water and sewage revenues, but a detailed breakdown of these revenues is not shown. •About 10% of total revenues are subsidies, such as the release of Deferred revenue from donors and governments.
	Subsidy details and trends	•The other income on the P/L includes donor and government grants as a breakdown item, which can be divided into (1) project-based grants from donors and governments that are accumulated in Deferred revenue and distributed over the useful life and (2) grants from governments that are recognized as revenue in a single year. •In FY2021, 1/3 of the grants are accounted for by the release of deferred revenue and the remaining 2/3 are accounted for by grants in a single year.
	Expenses Composition	•Salaries and employee benefits expenses account for about 30% of expenses. Corporate expenses comprise 13%, depreciation 13%, maintenance 7%, and impairment of financial assets (bad debts recorded on trade receivables) 5%, in that order. Further, the electricity accounts for 28% of operating cost.
3	B/S	
	Financing	•The equity ratio is about 50%, indicating a high degree of financial stability. However, the major part of this is evaluation surplus. •Long-term subsidies from governments and donors are recorded as deferred revenue, accounting for about 47% of total assets. The company is highly dependent on subsidies for capital investment. •"Payable to related parties" includes ADB and World Bank loans to the Solomon government which subleases to authority, which account for about 8% of total assets.
	Fixed Assets	•The number of facilities under construction has been increasing since FY 2019, but the depreciation of water system assets has also been increasing, which limits the total increase. •There is no information on the breakdown of "water systems" and no information on depreciation status, so the status of fixed assets related to water systems is uncertain.
	Accounts Receivable	•The accounts receivable turnover is 152 days. Which is much more than tariff collection cycle, 1 month. However, this remains at the same level from 2021.
4	C/F	
	Trends	•In the three-year period from FY2021 to 2023, the sum of donor/government grants and borrowings in the financing CF is significantly increasing and these money are invested in acquisition of plant and equipment. In particular, in 2022, the surplus of operating cash is also invested in acquisition of plant and equipment.

JICA Exchange rate in Oct 2024

1SBD= 17.3032 Yen

1USD= 142.296 Yen

1SBD= 0.1216 USD

GDP per capita (US\$)

2203.2 Year 2023, WB

3. Summary of bottleneck analysis

Summary of bottleneck analysis

Bottleneck analysis

1. Unknown customer satisfaction

Approximately 1,000 inquiries and complaints are received from customers per month. Complaints are varied and include water outages, reports of illegal connections and leaks, insufficient water pressure, and water charges. The most common type of complaint is reports of leaks.

There is no conducting a customer satisfaction survey or willingness-to-pay survey. The CEO advocates customer-focus. To promote customer-focus, it is important to conduct a customer satisfaction survey, for which external support is needed. Customer feedback is important for operations.

2. Increase in illegal connections due to strict enforcement of disconnections

Approximately 85% of customers do not pay on time. Total unpaid amounts amount to SBD 1 million. The reason for the improvement in the collection rate is the disconnection of customers with late payments and the introduction of pre-paid meters.

To expand the water supply coverage rate, the number of connected customers has increased from 9,600 (2016) to 18,500 (present), but there were many overdue bills, so SIWA has strengthened its response to disconnections for non-payment. As a result, 5,000 connections have been disconnected so far.

However, since the disconnected customers do not have alternative water sources, it is highly likely that they are illegally connected to SIWA's water pipes. As a result, only customers who pay the bill remain, and the amount of water collected has not increased much in the past year, resulting in an improvement in the rate of collection of bills. All but 50 customers have had meters installed, but there is the problem of measurement errors with the old meters. Cash (prepaid) water meter has been introduced but it is not well functioned.

3. High water bills due to continuous tariff increases

The cost of materials has also risen, forcing SIWA to raise water tariffs. In 2016, the water tariff for the minimum flow range was 4.89 SBD, but in 2024 it will be more than 9 SBD. Unit price and unit cost per m3 water sold are high. The water charge occupies 15% of household income according to JICA project report*1. Due in part to high water tariff, many unpaid users remain unable to pay their bills or steal water. Water charges are very high, and it is recognized that non-revenue water and electricity costs have a major impact.

4. High NRW

(1) Physical loss (Aging infrastructure)

- Approximately 60% of water transmission and distribution pipelines are 30-40 years old (installed in 1978).
- Aging pipelines are the primary cause of frequent leaks, with about 4,000 leaks reported annually.
- 80 km of pipelines have been identified for replacement, but only 10 km will be addressed under ongoing WB and ADB projects.

(2) Commercial Loss

- It is assumed that many disconnected customers illegally reconnect water services possibly due to financial difficulties.
- Meter measurement errors also play a minor role.
- Pre-paid meters have some issues and illegal connections persist, particularly in informal settlements.

(3) Organizational Challenges

- The NRW department, established in 2020, lacks a mid- to long-term plan and sufficient human resources.
- Frequent personnel changes hinder progress; only 2 of 15 engineers trained under a JICA project remain. The NRW team leader has changed frequently.

(4) Technical and Operational Constraints

- Preventive maintenance and systematic monitoring of NRW rates are insufficient.
- While NRW reduction was achieved in pilot DMAs during a JICA project, activities have not been sustained due to insufficient technology transfer and lack of a comprehensive NRW plan.
- Step tests and flow meters are used to identify high NRW in 28 DMAs, but resources such as leak detection equipment (only one set of leak detection equipment) are inadequate for wider implementation.
- The topography of the supply area in Honiara is flat near the sea but becomes highly undulating with multiple ridges in the hilly areas, making water pressure control extremely challenging and contributing to increased leakage..

5. Less human resources capacity development

Due to frequent personnel changes, the capacity of staff has not been sufficiently strengthened. Lack of competent technical personnel has caused delays and problems in DP project processes, etc. Recruitment of quality and skilled staff remains a serious issue. The average length of stay for staff is 6 years(?). The turnover rate over the past 3 years has been high. One of the reasons is the Ausie Mobility Partnership system has led to an increase in staff going to Australia to work. Capacity building is a critical component of SIWA strategic and annual work program. However, due to lack of funding. Staff training is provided where it is facilitated and supported by DPs and funded under specific DP projects. The number of staff per 1,000 connections is 12, which indicate human resource capacity need to be developed.

External Factors

6. High turbidity problem in raw water in heavy rain

Illegal commercial logging and poorly managed logging activities have caused deforestation upstream of the water source (**External factor**), which cause high turbidity (high levels of mud and soil particles) and water supply interruptions when it rains in the upper reaches of water sources. The main activity for restoration is to provide an alternative to deforestation. The average supply suspension in 2024 was 27 days and occurs when source turbidity reaches 20 NTU.

7. Potential collaboration and coordination activities with key stakeholders

For sustainability of the operation of SIWA, profitability is pursued. However, the removal from SOE position made it unclear for future position. To tackle illegal connections, SIWA is trying to work with police. To restore water resources from commercial logging, SIWA needs to coordinate with relevant ministries. To reduce cost of water supply, SIWA may need to work with MMERE for reduction of energy cost.

List of bottleneck analysis results and recommendations for improvement

No	Issues	Diagnostics	Recommendations for improvement
Internal Factors			
1.	Management and finance		
	Issues with accounting consistency and transparency	-	
	Low profitability	The operating cost coverage ratio is 121%, but excluding subsidies, it is a relatively low level at 111%. The cost of materials has also risen (as here is an island nation, rising fuel costs also lead to rising transportation costs), forcing SIWA to raise water tariffs. In 2016, the water tariff for the minimum flow range was 4.89 SBD, but in 2024 it will be more than 9 SBD. Water bills are very high, and it is recognized that non-revenue water and electricity costs have a major impact.	Review cost structure and operation efficiency, and make countermeasure plan for reduction.
	Challenges in the process of setting tariff	The water tariff has been continuously increased by about 10% annually since 2019. The unit price is very high (3.3USD/m3). The water charge occupies 15% of household income according to JICA project report.*1 Tariff Review is needed but has not been conducted; planned for this fiscal year.	Need to check affordability for adjustment.
	Lack of investment capital	DP supports investment capital.	
2.	Service provision and maintenance		
	The water supply coverage ratio and the population served are not growing.	The average supply suspension in 2024 was 27 days and occurs when source turbidity reaches 20 NTU. Intermittent supply duration varies by area. Kongurai Water Treatment Plant completion will resolve some issues. The government is drafting the Water Resource Bill for improved source management.	
	Insufficient infrastructure development	According to the 2008 JICA survey, approximately 60% of all water transmission and distribution pipelines were 30-40 years old after installation. The aging existing water transmission and distribution pipelines are considered to be the cause of high NRW. The inability to adequately renew aging pipelines has led to persistently high NRW rates and a decline in the quality of water supply services. The poor quality of water supply services is considered to be one factor in SW's exclusion from state-owned enterprises (SOE). Many of the pipelines were installed in 1978, and leaks are frequent due to aging. There are about 4,000 leaks per year. 80km of pipelines (diameter 100-300mm) have been set as priority for replacement, and 10km of these will be replaced in the WB and ADB UWSSP project, focusing on areas with particularly old pipelines and high leak rates. However, technical cooperation is not included in the components. A rapid sand filtration water treatment plant is under construction at the water source on high area in the easternmost part of the city. The water treatment plant under construction has a capacity of 15,000m3/day.	Renew aging water transmission and distribution pipelines.
	High non-revenue water (NRW) rate	In JICA technical cooperation project, reduction of NRW was achieved in pilot DMAs, but activities have not been continued, there is no technology transfer to maintain them nor a comprehensive plan to implement NRW reduction activities in a wider area. There is only one set of leak detection equipment, so only one team can carry out the work, and activities cannot be expanded. Four sets are needed to implement in other provinces (by SIWA). SOPs and other measures to address NRW were developed, but it is unclear whether they are being utilized. There are various possible reasons for the failure to implement continuous NRW control measures, including the lack of a dedicated department for comprehensive non-revenue water control both for physical and commercial losses, lack of sufficient technical personnel (lack of human resources), and frequent personnel changes (personnel not trained). There are 28 DMAs within the water distribution area, all of which are equipped with flow meters and in operation. NRW is calculated. Step tests are carried out for DMAs with high NRW. Regarding disconnections, customers are given three-month notices to pay, and if payment is not made, the service is disconnected. Approximately 10% of the total NRW is illegally connected*1 A very large number of illegally connected households reconnects their water supply after disconnection*1 Pre-paid meters are installed when installing new meters, including replacements, and are also installed in informal settlements. However, illegal connections are occurring frequently due to the difficulty of paying. Pre-paid Cash water meters were installed in 2018, but after two years they were not metering well and required extensive replacement. Replacement with post-paid meters was carried out*8 The NRW department has already been established in 2020. There is no mid- to long-term plan or personnel plan for comprehensively reducing physical and commercial losses. The JICA non-revenue water technical cooperation project conducted training for 15 engineers. However, only two members who received the training remain. The NRW team leader has changed three times in three years.	Review NRW reduction plans and formulate a comprehensive NRW management system for physical and commercial losses. .

No	Issues	Diagnostics	Recommendations for improvement
	High leakage rate	The main problems in high NRW (60%) are leaks and illegal connections. There are also some meter measurement errors. It is reported that there are no leak detectors or other equipment suitable for this condition and no systematic NRW control measures have been implemented. Leaks are frequent due to aging. There are about 4,000 leaks per year. 80km of pipelines (diameter 100-300mm) have been set as priority for replacement, and 10km of these will be replaced in the WB and ADB UWSSP project. 30 staff members are divided into 4 teams and work to reduce NRW. Illegal connections are the responsibility of the Customer Service department. The topography of Honiara city is flat near the sea, but the mountainous areas are very undulating and have several ridges, making it very difficult to control the water supply pressure.	Establish a systematic leaks control system in surface and ground. Renewal of aging water transmission and distribution pipelines.
	Insufficient maintenance of facilities		
	Water outage and unstable supply	The challenge for water services is the interruption of water supply during the rainy season when the raw water is highly turbid. This is due to deforestation upstream of the water sources resulting from commercial logging. The main activity is to provide an alternative to deforestation.	Need stakeholder coordination to manage commercial logging and restore deforestation in water source areas.
	No DX utilization and low operational efficiency	Asset management started renewal of aged pipelines. --> Check GIS usage. Pre-paid water meters have been introduced. --> Check cash (pre-paid) meter system.	Update GIS data and obtain technology of asset management
3.	Commercial Operations		
	Low customer satisfaction	Approximately 1,000 inquiries and complaints are received from customers per month. Complaints are varied and include water outages, reports of illegal connections and leaks, insufficient water pressure, and water charges. The most common type of complaint is reports of leaks . A comprehensive customer satisfaction survey including willingness-to-pay survey has not been carried out. The CEO advocates customer-focus as well as customer service, increased revenue, NRW, and safety are key issues. To promote customer-focus, it is important to conduct a customer satisfaction survey, for which external support is needed. Customer feedback is important for operations. Still inexperienced in fully using the GPS functionality and sending GPS-based customer information to the GIS database	Development of an organization for the provision of customer-oriented services.
	Low collection rate	Approximately 85% of customers do not pay on time (only 15% pay early). Total unpaid bills amount to SBD 1 million. SIWA has taken a tough stance against illegal and unpaid users. Due in part to high water tariffs, many unpaid users remain unable to pay their bills or steal water.*13 The reason for the improvement in the collection rate is the disconnection of customers with late payments and the introduction of pre-paid meters. To expand the water supply coverage rate, the number of connected customers has increased from 9,600 (2016) to 18,500 (present), but there were many overdue bills, so SIWA has strengthened its response to disconnections for non-payment. As a result, 5,000 connections have been disconnected so far. However, since the disconnected customers do not have alternative water sources, it is highly likely that they are illegally connected to SIWA's water pipes. As a result, only customers who pay the bill remain, and the amount of water collected has not increased much in the past year, resulting in an improvement in the rate of collection of bills. All but 50 customers have had meters installed, but there is the problem of measurement errors with the old meters. Cash water meter has been introduced but it is not well functioned. Previous prepaid meter installation (2,000 units, six years ago) damaged customer trust.	Establish water meter management system.
4.	Organization and Human Resource Management		
	Shortage of engineers and skills gap	Due to frequent personnel changes, overall technical skills are not well developed. Recruitment of quality and skilled staff remains a serious issue. The average length of stay for staff is 6 years(?). The turnover rate over the past 3 years has been high. This is because the Ausie Mobility Partnership system has led to an increase in staff going to Australia to work. 28 of the 30 people in the NRW department have never received systematic training. The NRW team leader has changed three times in three years. Capacity development is a critical component of our strategic and annual work program. However, due to lack of funding, staff training is provided where it is facilitated and supported by DPs and funded under specific DP projects. Recruiting a training coordinator. Retention strategies: Skill development, university scholarships, promotions, and change management plans	Preparation of human resources development plans and training of engineers and technicians.
	Reducing organizational efficiency		
	Lack of strategic management capabilities in the organization	Regarding organizational reform, SIWA is strengthening three areas: 1) Revenue service (disconnection and communication with customers), 2) Customer service (awareness campaigns on specific days, sending thank-you messages to customers who make sure to pay before the due date, development of the Solomon Water app, strengthening stakeholder engagement), and 3) Asset management (establishment of a unit, formulation of asset management policy, strategy and plan, etc.	
	Lack of planning	KPIs are monitored and open to public.	May need more effective KPIs.
	Governance issues	The Board composition has changed after removal of SIWA from State Owned Enterprise (SOE), but there is no impact on operations.	

No	Issues	Diagnostics	Recommendations for improvement
External factors			
5.	Environment (Water Sources)		
	Depletion of water sources and deterioration of water quality	High turbidity problem: Illegal logging and unmanaged logging activities can cause high turbidity (high levels of mud and soil particles) and water supply interruptions when it rains in the upper reaches of the Kongulai water source. About 50% of the water supply source for Honiara City's water supply system depends on the Kongulai spring. The Kongulai water source is subject to water supply interruptions when high turbidity problems occur due to illegal or poorly managed logging activities and heavy rainfall. A high turbidity treatment facility was constructed under the JICA grant project, but it appears to be under-utilized. The wells constructed under the JICA grant project have not been able to secure the planned water intake due to water source problems (JICA survey team is currently investigating the site).	Need stakeholder coordination to manage commercial logging and restore deforestation in water source areas.
6.	Government systems and politics		
	Hindering self-sustaining operations	For sustainability of the operation, profitability is pursued. However, the removal from SOE position made it unclear for future position. Currently, SIWA has authority as both operator and regulator regarding water resource management with the latter barely functioning.	
7.	Development Partner Support		
	Lack of development partner support	DFAT, ADB, WB and others are providing long-term support. It is considered that there are many facility development projects and few technical projects. The reason for the low number of technical assistance is considered that other DPs are aware of problems with the SIWA's organizational structure (e.g. frequent personnel changes, which makes it difficult to expect technical assistance to be effective).	Need to continuous supports from DPs especially for reduction of NRW.
8.	Socioeconomic and financing		
	Socioeconomic Impact		
	Lack of financial resources	The interest rate is too high for SW to borrow from commercial bank. The lending rate published by the central bank is 8.23% in June 2024.	

*1 L: Minor issue; M: Moderate issue; H: Major issue

*2 Urgent: within 6 months; Short-term: within 2 years; Medium-term: within 5 years; Long-term: 5 years or more

4. Diagnostics based on Growth Spiral (GS diag)

Overall diagnostics of growth spiral

Water services have improved, but the service coverage and financial situation have not improved much. Three spirals may be not working well but the increase in customers leading an increase in tariff revenue is working.

The trend in water production and continuity of service is positive, and the quality of water supplied is good, so it is considered that the water supply service is improving. However, service coverage is stagnant and customer satisfaction is potentially not high.

NRW is very high at around 60%. The high number of staff per 1,000 connections can lead to high labour costs. Although the turnover has increased slightly, the net profit is decreasing. The O&M cost coverage ratio excluding subsidies is not high (around 110%), which indicates insufficient own funds, and the utility cannot invest in major infrastructure from its own resources.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?

Diagnosis result
The amount of produced water increased from 2022 to 2023 but the amount of water sold is decreasing. Service hours has been increasing gradually. The quality of the water supply is good. The customer satisfaction seems to be very low according to the data and the water service coverage is stagnated. The spiral from 1 to 2 is not working well.

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
1	Investment cost (Currency)	35,811,005	-	-	
2	Production capacity (m ³ /day)	47,965	-	↗	
3	Production (m ³ /day)	36,885	-	↗	
4	Utilization ratio of production capacity (%)	77	-	→	
5	Continuity of Service (Hrs/day)	23.4	2	→	7
6	Quality of water supplied (Compliance rate: %) - The nums of samples complied/the nums of total samples of analysis per year	96.2	4	→	
7	Water supply pressure (m)	NA	-	→	
8	Leakage ratio (%)	42	-	→	2

The year of Investment cashout is 2021.

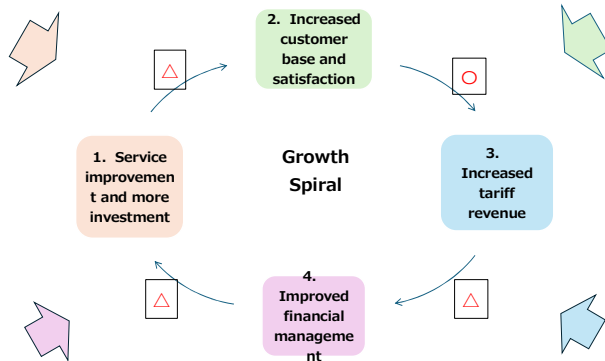
(4→1) Is the financial improvement leading to investment activities?

Diagnosis result
The utility cannot invest to major infrastructure with own fund since EBITDA margin excluding deferred income are around 10.5%. The O&M cost coverage excluding subsidies (110.8%). The spiral from 4 to 1 is not working well because the utility is unable to invest its own funds in infrastructure.

Legend
○ Working well
○ Working
△ Not working well

Note:
The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
9	Population served	65,000	-	↗	5
10	Service coverage / Water coverage (%)	74.0	2	→	5
11	Customer satisfaction (%)	NA	NA	→	1, 8
12	Water sold (m ³ /day)	14796.7	-	→	
13	Water consumption per capita per day (L/c.a./day) - Total water sold/population served	227.6	-	-	



KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
19	Accounting system	IFRS (Accrual basis)	3	-	
20	Net income (Currency)	6,865,781	-	↘	6
21	EBITDA (Currency)	26,481,426	-	→	6
22	EBITDA margin (%)	20	2	→	6
23	EBITDA margin excluding deferred income (%)	10.5	2	↗	
24	Total capital operating margin (%)	1.2	-	↘	
25	Operating profit margin (%)	4.7	2	↘	
26	Equity ratio (%)	47.7	3	↘	
27	Fixed long term conformity rate (%)	89.6	3	↗	
28	O&M cost coverage ratio (%)	121.3	2	→	6
29	O&M cost coverage ratio excluding subsidies (%)	110.8	2	↗	6
30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	25.4	-	→	
31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	24.6	-	→	
32	Subsidies (Currency)	165,218	-	↘	
33	Development Partner grant support (Currency)	12,379,860	-	→	
34	The ratio of subsidies and DP support to turnover	9	-	↘	
35	Number of staff per 1,000 connections	12	1	→	

1USD= 0.1208 USD

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?

Diagnosis result
The turnover is slightly increasing and the collection ratio is increasing. It seems that the spiral from 2 to 3 is working. The meter installation ratio has also increased. The water tariff level has increased, but NRW ratio is quite high.

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
14	Turnover - revenue from sales	132,725,843	-	↗	4
15	Collection ratio (%) - bills collected /total billed	96	3	↗	
16	Non-revenue water ratio(%)	60.0	1	→	2
17	Metering ratio (%) - the meter installed customers/total customers	100	4	↗	
18	Water tariff level	51	-	↗	3

(3→4) Is the tariff revenue improvement leading to financial improvement?

Diagnosis result
The turnover is increased but net profit is decreasing. The number of staff per 1000 connections (12) is as high; efficiency of human resources is not high. The spiral from 3 to 4 is not working well since mainly the net income is decreasing and O&M cost coverage excluding subsidies is not high.

5. Strategy analysis

Medium- to long-term direction of the water utility

1. SW's Vision, Mission, and Values :

(1) Vision: Safe water for a healthy nation

(2) Mission: "To provide reliable and safe water supply and sewerage systems within our area of operations in Solomon Islands, while working in partnership with the community to plan, deliver and operate infrastructure in a manner that seeks to minimize the social and environmental impacts of our activities."

(3) Core Values: In pursuit of its mission, SIWA will continue to be guided by the following six Core Values – defining its desired corporate culture: (a) Impartiality, (b) Morality, (c) Professionalism, (d) Accountability, (e) Consistency, (f) Transparency

(4) Motto: In line with its core values – SIWA shall use the following motto to rally employees, customers, suppliers, and stakeholders, in general, behind its vision and mission: "Safe reliable, affordable and sustainable water services with positive IMPACT"

2. Statutory Functions of Solomon Water

Solomon Water is created and legislated under the State Owned Enterprises Act 2007, the Solomon Islands Water Authority Act 1992.

*SW became a State-Owned Enterprise in 2007 under the State-Owned Enterprise (SOE) Act. However, the Government announced the removal of the Solomon Islands Water Authority (SIWA), which is trading as Solomon Water from its position as a State-Owned Enterprise (SOE) on Aug. 26, 2024. Currently, SW continues to operate under the Solomon Islands Water Authority Act.*1

3. 30 Year Strategic Plan (by 2047)*2

Through the 30 Year Strategic Plan, SW has adopted a target of achieving 95% coverage of properties within its service areas with access to the reticulated water supply network.

4. Five Year Corporate Strategic Plan (2024 - 2028)(draft)*3

Under the Five Year Corporate Strategic Plan(draft), SIWA through its Strategic Plan will pursue the following five Strategic Objectives during the five-year period (2024 - 2028):

-**Customer Focus:** SIWA aims to become a customer-centric organization by (1) delivering safe, reliable, **affordable**, and sustainable water and sanitation services, (2) communicating and engaging with customers and stakeholders, (3) delivering customer outcome, and (4) becoming a high performing organization.

-**Human Resources:** SIWA will enhance the skills of leaders and staff to improve operational safety, performance, and customer service, ensuring a well-resourced and efficient organization.

-**Environment:** SIWA is committed to the sustainable use and management of the environment and natural resources, implementing major projects to secure safe water supplies and reduce environmental impact.

-**Safety:** Ensuring the health, safety, and well-being of staff and customers is paramount. SIWA will provide necessary systems and equipment for safe operations and continuously improve safety practices.

-**Operational Performance:** SIWA aims to provide safe, reliable, affordable, and sustainable water and sanitation services by understanding and improving

Suggestions for improvement

Overall Goal:

"Universal Access to Safe and Sustainable Water Services"

This goal aligns with SW's vision of providing safe water for a healthy nation and aims to ensure that every individual within the service areas has access to reliable and safe water supply and sewerage systems. It emphasizes sustainability and community partnership to minimize social and environmental impacts.

Mid-Term Goal:

"SIWA transforms into a financially self-sustained, customer-focused water utility implementing effective management practices, developing human resources, and strengthening NRW (Non-Revenue Water) management

This customer-focused organizational transformation is a priority aligned with the Five-Year Corporate Strategic Plan and is foundational to make growth spiral of SIWA functional.

Vicious Spiral:

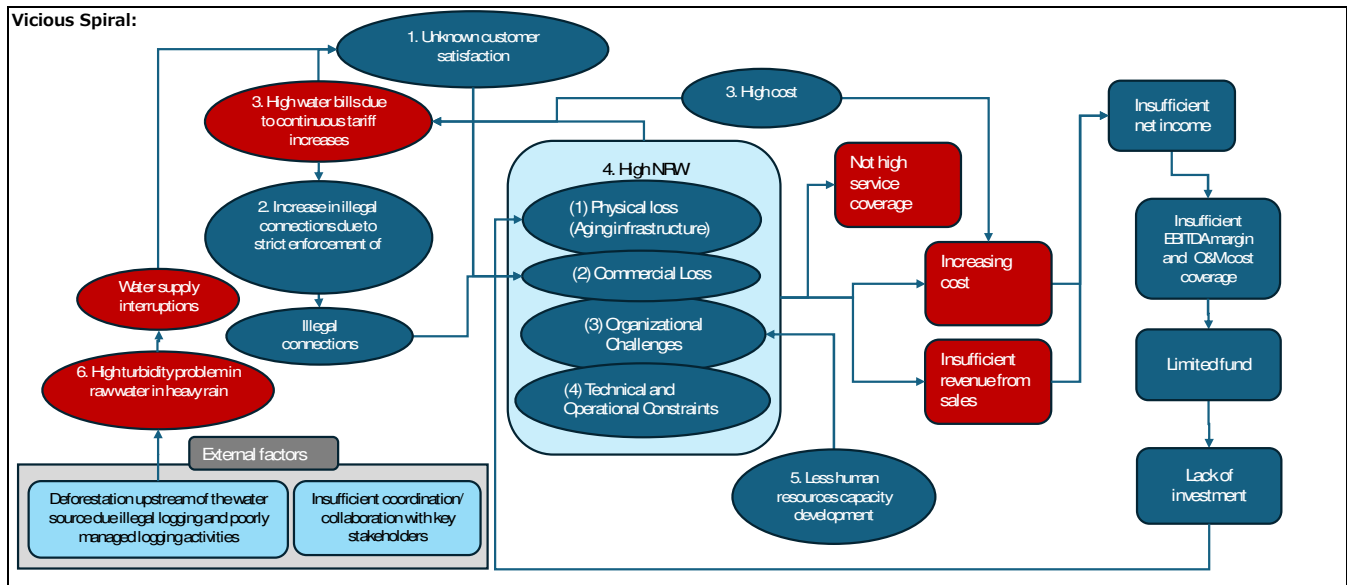
Potential shortcomings in service delivery, such as leaks, water supply outages, and high tariffs, contribute to an increase in customer complaints and dissatisfaction, further eroding trust and willingness to pay. This, in turn, leads to a rise in customer disconnections, which often results in illegal connections and a reduced customer base. High non-revenue water (NRW), caused by aging infrastructure, illegal connections, and inadequate maintenance, diminishes revenue and necessitates tariff hikes, placing an even greater burden on customers. These factors collectively drive further increases in water tariffs. Frequent staff turnover and insufficient training programs weaken operational capacity, exacerbating service delivery issues and hindering effective NRW management. Deforestation and unmanaged water sources lead to water quality degradation and supply interruptions, further diminishing customer satisfaction. There is potential to enhance collaboration and coordination with key stakeholders.

Virtuous Spiral (suggestions for improvement):

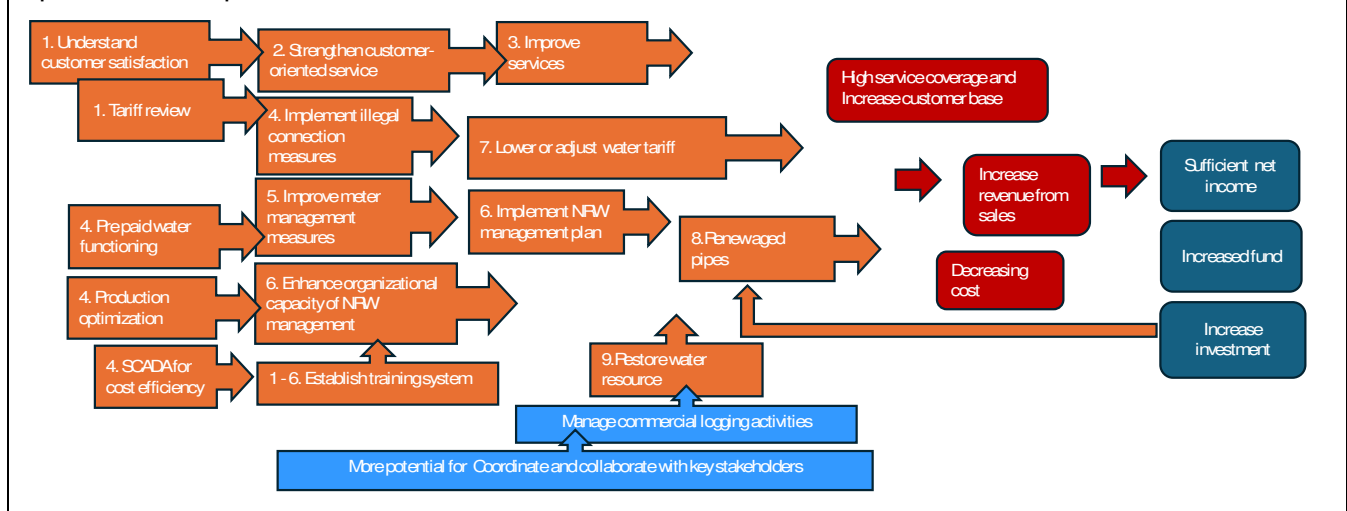
Customer satisfaction and needs will be assessed to prioritize improvement measures, forming the foundation for strengthening customer-oriented services.

Measures to address illegal connections and improve meter management will be implemented in collaboration with the police. Comprehensive NRW management capacity will be enhanced, scaling up successful pilot projects conducted by JICA, and an NRW management plan will be developed and executed. With an allocated investment budget, aging pipelines in high-leakage areas will be renewed. Throughout these initiatives, a more affordable water tariff structure will be established to reduce the financial burden on customers. To ensure the sustainability of these efforts, a robust training system will be implemented.

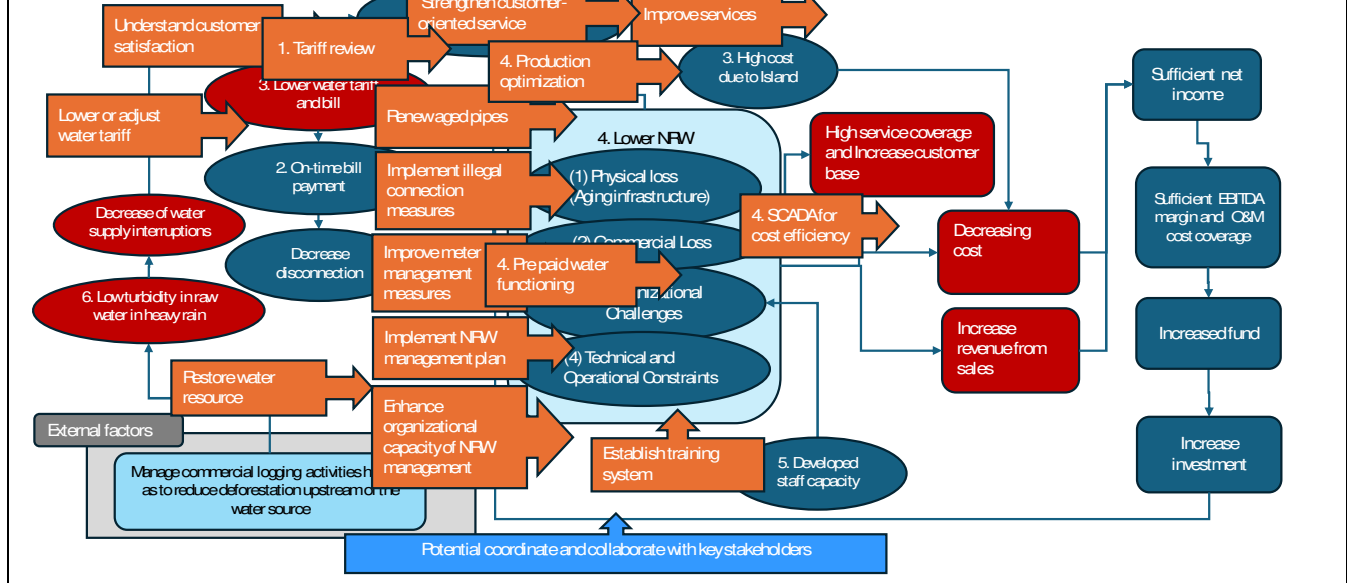
Additionally, water source areas will be effectively managed to improve water quality and minimize supply interruptions. Opportunities for enhanced coordination and collaboration with key stakeholders will be pursued to support these objectives.



Steps to make Growth Spiral work



Virtuous spiral



*1 <https://islandsbusiness.com/news-break/solomon-water-removed-from-soe/>
 *2 [30YearStrategicPlanSummary.pdf](#)
 *3 Solomon Islands Water Authority, Five Year Corporate Strategic Plan 2024 to 2028 (July 2024) (draft)

6. Potential Solutions

Goals

Overall Goal	Universal access to safe and sustainable water services is achieved.
Mid-term Goal	SIWA transforms into a financially self-sustained and customer oriented water utility through developed human resource and strengthened NRW management

Outcomes

	Outcomes	Indicator	Target		
			Base line	2030	Long term
1	Customer-oriented service is strengthened.	Customer satisfaction (%)	No data	After survey	After survey
2	NRW management is implemented.	NRW (%)	60.2	50	30 (30 year)
3	Water tariff is lower or adjusted considering affordability.	Water tariff level (% of household income)	15?	?	5?
4	Training system is established.	Availability of training system and continuous operation	1% (Recruiting training manager)	3% of labour cost for training	?
5	Aged pipes are renewed.	Ratio of aged pipes (age +) (%) - 80km	80km	50km	0
6	Water resources are restored.	Days of suspension of water supply (days/annual)	27	13	0

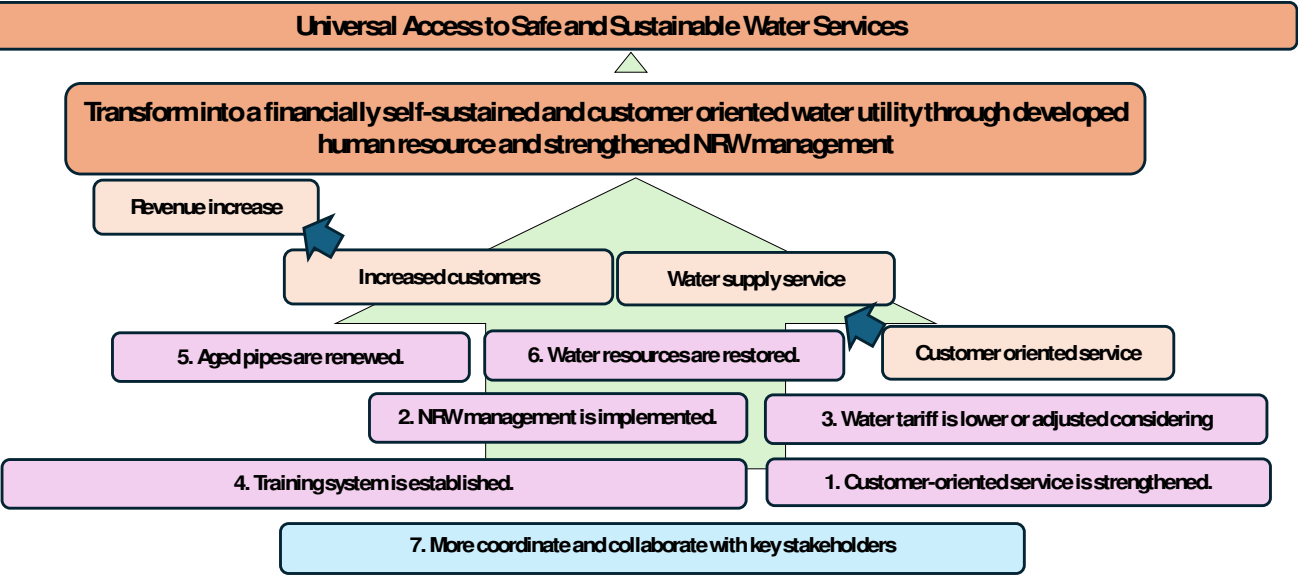
External actions

7	More coordinate and collaborate with key stakeholders				

Activities

		Target	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	Long-term
1	Customer-oriented service is strengthened.								
	1 Understand customer satisfaction	Urgent							
	2 Formulate a customer-oriented service plan	Urgent							
	3 Strengthen customer-oriented service	Medium							
2	NRW management is implemented.								
	1 Formulate NRW management plan based on the previous JICA project	Short							
	2 Strengthen comprehensive NRW management capacity	Medium							
	3 Implement NRW management plan	Medium							
3	Water tariff is lower or adjusted considering affordability.								
	1 Prepare a road map to reduce or adjust water tariff	Short							
	2 Implement road map	Medium							
4	Training system is established.								
	1 Assess existing HR capacity reviewing the existing organizational reform and transformation plan	Urgent							
	2 Prepare a human resource development and training plan	Short							
	3 Implement the human resource development plan	Medium							
5	Aged pipes are renewed.								
	1 Formulate a aged pipe replacement plan with modern network technology	Short							
	2 Restructure and modernize transmission and distribution system	Long							
6	Water resources are restored.								
	1 Assess existing situation of deforestation	Short							
	2 Prepare a manage plan of commercial logging activities	Short							
	3 Implement management plan	Medium							
7	More coordinate and collaborate with key stakeholders								
	1 Identify the areas, approaches, and measures of collaboration and coordination with key stakeholders (MMERE, MEF, Police, etc.) for improving water supply service and performance	Short							
	2 Enhance collaboration with key stakeholders	Medium							

Scenario of Improvement



0. Benchmark

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (Currency)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %) - The nums of samples complied/the nums of total samples of analysis per year	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure (m)	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served	—	—	—	—
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) - Total water sold/population served	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover - revenue from sales	—	—	—	—
		15	Collection ratio (%) - bills collected /total billed	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25% (15-25%)	Less than 15%
		17	Metering ratio (%) - the meter installed customers/total customers	80% or less	80-95%	Aim for 100% (95-99)	99-100%
Prerequisites	4. Improved financial management	18	Water tariff level	—	—	Aim for a level of sustainable investment	—
		19	Accounting system	—	—	Accural basis	—
		20	Net income (Currency)	—	—	—	—
		21	EBITDA (Currency)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excluding deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
		25	Operating profit margin (%)	Negative	Less than 10%	Aim for 10% or more	—
		26	Equity ratio (%)	—	Less than 40%	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (Currency)	—	—	—	—
		33	Development Partner grant support (Currency)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
Human resource efficiency		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Les than 4.0

3a. Bottleneck analysis (details)

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
Internal Factors	1	Management and finance			
		Accounting consistency and transparency issues			
		Financial statements are made not on the accrual basis of accounting.	☒	☐	
		There is no fixed assets register for financial management	☒	☐	Asset information is registered in the Pronto, and when financial statements are prepared, depreciation expenses for the relevant year are automatically calculated. However, since Pronto is not a system specialized for the water supply business, if there is a system optimized for the water supply business, we would like to consider migrating to it.
		Low profitability			
		The water revenue is insufficient to recover O&M costs.	☒	☐	
		The water revenue is insufficient for full-cost recovery including investment cost	☐	☒	The operating cost coverage ratio is 121%, but excluding subsidies, it is a relatively low level at 111%. Regarding the use of profits, while SIWA were SOEs they were required to pay dividends to the government when SIWA made profits, but since SIWA is no longer SOEs, SIWA is no longer required to do so. SIWA may use the profits for small-scale renovation investments, but SIWA is not required to cover CAPEX with water revenue, and water tariff is basically approved by the MMERE Minister.
		Unit price of water supply is low	☐	☒	The unit price is very high (3.3USD/m3). The water charge occupies 15% of household income according to JICA project report.*1
		Unit cost of water supply is high	☐	☒	The unit cost is very high (3.1USD/m3). Especially since COVID-19, fuel costs have risen significantly, and the cost of materials has also risen (as here is an island nation, rising fuel costs also lead to rising transportation costs), forcing SIWA to raise water tariffs. In 2016, the water tariff for the minimum flow range was 4.89 SBD, but in 2024 it will be more than 9 SBD (tariff table received).
		Process for setting water tariff is not in place			
		Water tariff is not reviewed on a regular basis	☒	☐	Tariff Review is needed but has not been conducted; planned for this fiscal year. Customer satisfaction survey is required first (JICA recommendation). Lifeline Tariff needs government subsidies to ensure affordability. Unclear whether current tariffs include DP loan repayments; to be confirmed in the Tariff Review.
		Water tariff is not revised in response to increases in operating costs such as inflation	☒	☐	The water tariff has been continuously increased by about 10% annually since 2019. Increase revenue through tariff adjustments and customer base expansion.
		Insufficient planning and investment funding shortage			
		No business operation plan and facility development plan have been prepared.	☒	☐	30 YEAR Strategic Plan 2017 - 2047. SIWA has adopted a target of achieving 95% coverage of properties within its service areas with access to the reticulated water supply network *15 water facility development plan is included in "Solomon Islands Priority infrastructure investment pipeline 2021 Aug21" *20
		No financial projection of short to long term funds	☐	☒	While the strategic plan for 2017 to 2047 and its action plan for 2017 to 2022 were formulated, this does not include financial projection. Stagnant investment activity: SIWA consistently struggles with financial management and is unable to invest in business continuity and critical infrastructure upgrades*25
		High reliance on external funding such as subsidies in multi-year business plans	☐	☒	The financial capacity of SIWA is very limited, with heavy reliance on external funding for capital works, renewals and senior management. *15
	2	Service provision and maintenance issues			
		The water supply coverage ratio and the population served are not growing.			
		The water supply coverage ratio and the population served are not growing.	☒	☐	The construction of Kongurai Water Treatment Plant was suspended and not yet started; contractor re-selection is required.
		Insufficient infrastructure development			
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☐	☒	The generally discrete operation of supply zones and insufficient reticulation storage across most systems results in frequent water outage, as there is limited ability to supply water from other systems *15 New water supply facilities such as well facilities and water treatment plants are being developed with DP support. However, the extent of the gap between water demand and facility capacity is unknown. Many of the pipelines were installed in 1978, when the country first gained independence, and leaks are frequent due to aging. There are about 4,000 leaks per year. 80km of pipelines (diameter 100-300mm) have been set as priority for replacement, and 10km of these will be replaced in the WB and ADB UWSSP project, focusing on areas with particularly old pipelines and high leak rates. However, technical cooperation is not included in the components. A rapid sand filtration water treatment plant is under construction at the water source on high area in the easternmost part of the city, and deliver water to new residential developments in the west via multiple distribution reservoirs. Groundwater is supplied to the distribution reservoirs along the way. The water treatment plant under construction has a capacity of 15,000m3/day.
		Development of new facilities is not progressing			
		There is a lot of aging infrastructure	☐	☒	Approximately 60% of all water transmission and distribution pipelines are 30-40 years old after installation (2008)*11.
		High non-revenue water (NRW) rate			
		Water balance not calculated	☐	☒	Most NRW measures are implemented in water distribution areas. The lack of quantification of water losses from water transmission facilities and distribution reservoirs is one of the reasons for high NRW*1 There are 28 DMAs within the water distribution area, all of which are equipped with flow meters and in operation. Flow measurements are carried out once a week, and NRW is calculated. Step tests are carried out for DMAs with high NRW. There are many valves for step tests. In the past JICA technical cooperation project, reductions were achieved in pilot DMAs, but there is insufficient technology transfer to maintain them or a comprehensive plan to implement NRW reduction activities in a wider area. Illegal connections are rising, with commercial losses increasing from 15% (2023) to 27% (2024) (within NRW of 60%). Physical losses have decreased, likely due to leakage control measures within DMAs, but further verification is needed. Step tests were conducted in 25 DMAs last year, the highest number recorded.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		High commercial loss	☐	☒	<Illegal connection> Approximately 10% of the total NRW is illegally connected*1 A very large number of illegally connected households reconnects their water supply after disconnection*1 - Regarding disconnections, customers are given three-month notices to pay, and if payment is not made, the service is disconnected. SIWA takes a tough stance against illegal and unpaid users. Due in part to high water tariffs, many unpaid users are left unable to pay their bills or have stolen water*13 Due to leakage and theft of water from existing transmission pipes, the water supply pressure and the amount of water delivered to the distribution reservoirs are lower than assumed at the time of planning. As a result, the water distribution pressure from the distribution reservoir onwards is reduced *12. <water meter> Difficulties with pre-paid Cash water meters have also impacted NRW and revenue*2 Pre-paid Cash water meters were installed in 2018, but after two years they were not metering well and required extensive replacement. Replacement with post-paid meters was carried out*8 Meters are regularly inspected for performance and accuracy, and calibrated or replaced if necessary.*29 The increase in meter installation rate from 60% to 99% between 2022 and 2023 is largely due to the installation of pre-paid meters with DFAT's support. Squatters do not have pre-paid meters and are unable to pay the fees, so their connections are illegal. Pre-paid meters are installed when installing new meters, including replacements of malfunctioned meters, and are also installed in informal settlements. However, illegal connections are occurring frequently due to the difficulty of paying. Non-physical losses have increased sharply, requiring reassessment of customer disconnections, reconnections, and new connections data. A new anti-theft initiative (SWATT: Solomon Water Anti-Theft Team) has been launched. Legal action against offenders is planned to serve as a deterrent alongside efforts to convert illegal connections into legitimate ones.
		There is no specialized department for managing non-revenue water.	☐	☒	The NRW department has been established in 2020. It is a team of 30 people who only manage physical losses, and there is no special team to deal with commercial losses, which is managed by Customer Service Department. The JICA non-revenue water technical cooperation project conducted training for 15 engineers. However, only two members who received the training remain. Therefore, 28 of the 30 people in the NRW department have never received systematic training. The NRW team leader has changed three times in three years, and is now on his fourth. Most of the changes are due to retirement.
		There is no plan to reduce non-revenue water, and no measures have been implemented.	☐	☒	SIWA monitoring of NRW rates remains a passive measure, such as receiving and responding to reports of leaks by telephone from customers*13. There is no mid- to long-term plan or personnel plan for comprehensively reducing physical and commercial losses. NRW activities follow SOPs and manuals developed under technical cooperation. DMA interventions include customer surveys, Minimum Night Flow (MNF) monitoring, and step tests. The existing NRW management plan is outdated and needs revision based on factual data. Four teams are working on NRW reduction, but budget and human resources remain insufficient. Staff have been sent to Manila Water for NRW management training.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		High leakage rate			
		Many leaks are caused by deterioration of water pipes	☐	☒	The main problems in NRW are leaks and illegal connections at about 60% (70% according to the actual values). There are also some meter measurement errors. An action plan has been created for illegal connections, and as crackdowns entail risks for staff, SIWA plans to work with the police to address the problem. Many of the pipelines were installed in 1978, when the country first gained independence, and leaks are frequent due to aging. There are about 4,000 leaks per year. 80km of pipelines (diameter 100-300mm) have been set as priority for replacement, and 10km of these will be replaced in the WB and ADB UWSSP project, focusing on areas with particularly old pipelines and high leak rates. However, technical cooperation is not included in the components. The material of the water distribution pipes is PVC. There are standards for water distribution pipes, with the transmission and distribution pipes being PN12Mpa and the supply pipes being PN16Mpa. PVC is weak against impacts and prone to leaks at the connections, so we would like to change it to HDPE pipes, but HDPE pipes are more expensive than PVC pipes. 80 km of aging pipelines have been identified for replacement based on pipe age and leak-prone areas. ADB has allocated \$2 million for NRW measures, including 10 km of pipeline replacement (tendering this year, construction in 18 months). A plan is in place to replace 5 km of pipelines annually.
		Leak detection is not being carried out systematically	☐	☒	In JICA's NRW reduction project (2016), DMAs were constructed in Honiara and led to a reduction in the NRW rate. However, most recently, the NRW rate has worsened. *1 The main measures in the DMA are repairing surface leaks. The effect of reducing the NRW rate was confirmed after repairing surface leaks in the PJ. *1 80% of NRW is leaks. In particular, leaks from off-public roads, aging distribution pipelines and water supply systems *1 Many of the existing water supply pipes were found to be buried in non-paved places such as unpaved roads, hills and bushes, etc.. So, technology transfer would be more effective if more leak detectors and other equipment suitable for these conditions are provided *13 Household leakage in households without water meters is also a serious problem*12. → to be checked whether the DMAs, manuals and SOPs developed by the JICA PJ are utilized or not. 30 staff members are divided into 4 teams and work to reduce NRW. 15 staff members are in charge of leak repair (maintenance) and repair 4,000 leaks per year. Six staff members are responsible for leak inspections and nine staff members are responsible for leak diagnosis (step tests). Illegal connections are the responsibility of the Customer Service department. There is only one set of leak detection equipment, so only one team can carry out the work, and activities cannot be expanded. <u>Four sets are needed to implement in other provinces</u>
		Water pressure distribution is not controlled	☐	☒	Although DMAs were able to reduce the NRW ratio during the implementation of the technical programmed (*13), the subsequent status of the NRW ratio suggests that it has not been adequately controlled. There is a large proportion of small diameter reticulation pipes within the system, which accounts for poor supply pressures across much of the network, particularly in Rove, Mataniko, Panatina and Lungga areas of Honiara.*15 SCADA system has been installed and is operational.*21 The topography of Honiara city is flat near the sea, but the mountainous areas are very undulating and have several ridges, making it very difficult to control the water pressure. Localized high water pressure is also an issue, so there are plans to install pressure reducing valves (PRVs). Data loggers are being fitted to measure water pressure.
		Insufficient maintenance			
		There is no up-to-date facility inventory for facility O&M	☐	☒	GIS data exist, and does not appear to have been updated*13. --> Need to check the update of GIS
		Regular maintenance of equipment is not carried out	☐	☒	SIWA operates each well by adjusting the water intake through pump operation and valve adjustments. However, operation by frequent switching on and off of the power supply generates an excessive load on the pumps, which may accelerate the deterioration of the equipment by inducing the water hammer phenomenon. A maintenance management plan has been developed in the JICA follow-up plan. *4 Maintenance of equipment also does not appear to be implemented from a preventive approach perspective*13 Water asset maintenance is partially periodic, partially reactive.*29 <u>Lack of resources, lack of funding for capex and maintenance program implementation above routine O&M reactive works*29</u>
		No budgeted maintenance plan	☐	☒	As maintenance management from a preventive approach has not been implemented, there appears to be less budgeted maintenance plan in place. Operation and maintenance of systems is largely reactive.*15
		Water outage and unstable supply			
		Water supply infrastructure capacity is insufficient (gap between demand forecast and facility capacity)	☐	☐	
		Water supply volume and quality are unstable (condition of water intake source)	☐	☒	The challenge for water services is the interruption of water supply during the rainy season when the raw water is highly turbid. This is due to commercial deforestation upstream of the water source. DFAT conducted an assessment of the deforested watershed. In response, WB&ADB is carrying out watershed management activities. The main activity is to provide an alternative to deforestation. Transactions are being made using carbon trading and payment of ecosystems (by field survey).
		No DX implementation and low operational efficiency			
		There is no strategy for implementing digital transformation	☒	☐	
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases,	☒	☐	Asset management is conducted in GIS. Asset management started for renewal of aged pipelines. --> Check GIS usage. The official website contains publicity brochures, complaint forms and tariffs, etc. Facebook is used to frequently send out information on water cuts, etc. *19
	3	Commercial Operations			
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☐	☒	Customer base and GIS are not well aligned*1 Still inexperienced in fully using the GPS functionality and sending GPS-based customer information to the GIS database*13. 60% of the facilities are old and they need to be systematically updated, so CEO established an asset management team and plans to strengthen asset management.
		There is no established process for handling complaints, or there are problems with handling complaints	☐	☒	Five main complaints: Price of water, disconnection, supply reliability, restoration of services and high bill*29 SIWA is currently assessing the collection of customer data to distinguish between customer enquiries, complaint and disputes to enable it to better understand its customer service performance and customer experience KPI *27 The Customer Charter was created around 2000. There is no record of conducting a customer satisfaction survey or willingness-to-pay survey. The CEO advocates customer-focus as well as customer service, increased revenue, NRW, and safety are key issues. The five-year strategic plan strengthens customer service in line with the core functions described in the SIWA Act. To promote customer-focus, it is important to conduct a customer satisfaction survey , for which external support is needed. Customer feedback is important for operations. Approximately 1,000 inquiries and complaints are received from customers per month (approximately 30 per day). When a complaint or inquiry is received, the goal is to respond within three days, and although strict statistics are not kept, the response time is about three days on average. Customers can make inquiries and complaints via social media, telephone, visits to the Customer Office, email, a developed app, etc. Complaints are varied and include water outages, reports of illegal connections and leaks, insufficient water pressure, and water charges. The contents are registered in an enterprise resource planning (ERP) system called Pronto, and depending on the content, different departments such as the NRW team or the Customer Connection team (which handles illegal connections) are asked to handle the complaint.
		Low collection ratio			

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		The water tariff collection process (including unpaid fees) is not effective/efficient	☐	☒	Approximately 85% of customers do not pay on time (only 15% pay early). Total unpaid amounts amount to SBD 1 million. The reason for the improvement in the collection rate is the disconnection of customers with late payments and the introduction of pre-paid meters. To expand the water supply coverage rate, the number of connected customers has increased from 9,600 (2016) to 18,500 (present), but there were many overdue bills, so SIWA has strengthened its response to disconnections for non-payment. As a result, 5,000 connections have been disconnected so far. However, since the disconnected customers do not have alternative water sources, it is highly likely that they are illegally connected to SIWA's water pipes. As a result, only customers who pay the bill remain, and the amount of water collected has not increased much in the past year, resulting in an improvement in the rate of collection of bills. All but 50 customers have had meters installed, but there is the problem of measurement errors with the old meters. Meter readers are transported to and from various areas of Honiara City using one allocated vehicle. In the suburbs of Honiara City, residential areas are scattered across the lowlands and uplands, with steep terrain and areas that are difficult to access by vehicle. *1 Standard Operating Procedures (SOPs) for the water meter reading and billing process exist, but customer information is not being sent from the meter reading team to the GIS database in a timely manner and in the correct format. *13
		The payment method is inconvenient for customers (customers have some complaints)	☒	☐	SIWA has taken a tough stance against illegal and unpaid users. Due in part to high water tariffs, many unpaid users remain unable to pay their bills or steal water. *13 Cash (prepaid) water meter has been introduced but it is not well functioned. Previous prepaid meter installation (2,000 units, six years ago) damaged customer trust. 800 new meters are being procured from South Africa (World Bank support), with plans to expand to 6,000 units if successful. Priority installation for disconnected customers, targeting 70% coverage in commercial areas. Unit price: \$134, with DP support requested.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
	4	Organization and Human Resource Management Issues			
	Shortage of engineers and skills gap				
		There is a shortage of engineers with specialized knowledge	☐	☒	SIWA needs additional technical capacity - Water treatment*29 - Engineering - Hydraulic modelling - Design capabilities *29 Recruitment of quality and skilled staff remains a serious issue.*1 The average length of stay for staff is 6 years(?). The turnover rate over the past 3 years has been high. This is because the Ausie Mobility Partnership system has led to an increase in staff going to Australia to work.
		No skills and training strategy or plan	☐	☒	SIWA should implement the key areas identified for strengthening organizational capacity ※14 Capacity building is a critical component of our strategic and annual work program. However, due to lack of funding, staff training is provided where it is facilitated and supported by DPs and funded under specific DP projects. Table 19 below illustrates the various training provided across the organization in the current reporting period. *27 Recruiting a training coordinator. Retention strategies: Skill development, university scholarships, promotions, and change management plans. ~~External employment offers higher salaries, impacting staff retention, particularly in DP projects.~~
		Regular training and development programs are not provided adequately.	☐	☒	The main training curricula currently in place: Leadership training, supply chain training, asset management training, PE welding, safety compliance training, project management training, hydraulic modelling*29
	Declining organizational efficiency				
		There is no annual evaluation and goal setting system for staff	☒	☐	SIWA has an annual appraisal and target setting system for all staff*29
		Performance-based rewards and promotions are not implemented in the personnel system	☐	☐	It is not clear whether utilities' rules include performance based rewards.*29
		No power to hire and fire staff (within the bounds of an agreed plan)	☒	☐	SIWA can freely set and implement the hiring and salaries of SW staff without the involvement of MMWRE (MMERE).
	Lack of strategic management capabilities in the organization				
		Not setting and monitoring enough Key Performance Indicators	☒	☐	Regarding organizational reform, SIWA is strengthening three areas: 1) Revenue service (disconnection and communication with customers), 2) Customer service (awareness campaigns on specific days, sending thank-you messages to customers who make sure to pay before the due date, development of the Solomon Water app, strengthening stakeholder engagement), and 3) Asset management (establishment of a unit, formulation of asset management policy, strategy and plan, etc. The policy has already been approved by the CEO and is awaiting final approval from the board of directors. 25% of the strategy has been created. This will then lead to a pipeline renewal plan. Regarding NRW management, SIWA have adopted an Asset Management plan. This has become a good platform for discussions with the DP. Currently creating a digital plan. Automation, data utilization and processing, AI. Currently creating a strategy with WB.
		Specific targets and deadlines associated with each strategic objective are not clearly defined.	☒	☐	The SW 5-Year Corporate Strategic Plan 2024 - 2028 outlines specific strategies and targets.*28 (Ex. Prioritization Report – Water Supply Pipeline Rehabilitation, Honiara (SP1) by SMEC in August 2022. The report aimed at identifying 10km of mains from replacement to address ongoing water mains leakage issues which contributes to high NRW. The report assessed and prioritized 28km of for replacement which was further shortlisted to 10km of mains to proceed to detailed design phase. *28) The SW Organization Reform and Transformation Report describes the direction of future reform.*26
		There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☐	☒	The effectiveness and performance measures for the project unit currently reflect the reporting measures set by the DPs. These reporting KPI's do not effectively measure the project unit's program performance. The current resourcing and structure of the project unit established within SIWA to deliver its program of works that is aligned with SIWA Strategic Business Goals needs to be revised and additional resourcing provided to support SIWA infrastructure development program. *26 →It has been pointed out that the KPIs set are not sufficient for monitoring the project units that carry out infrastructure projects.
	Governance issues				
		Important decision-making processes are not clear and are not made in a collegial manner.	☐	☐	With SIWA being removed from SOE, the power to appoint board members will change. Previously, appointments were made within SW and subject to ministerial approval, but now the power to appoint has been transferred to the ministry. There will be no changes to the accounting system, etc. After removal from SOE, the board members have changed significantly. Originally, many of the members had business backgrounds, but now there are many government members, and deputy ministerial-level officials from the Commission of Police, Commission of Land, MMERE, MoF, etc. are board members. In JICA projects, changes in counterpart members, especially at management level, frequently led to delays in decision-making of some activities*1
		The division of responsibilities within the organization is not clear.	☐	☐	In August 2024, the Solomon Islands Government, through Cabinet, removed SIWA as a State-Owned-Enterprise*5 The Board composition has changed, but there is no impact on operations. The reporting obligation to MFT (Ministry of Finance and Treasury) has been removed, reducing the administrative burden.
External factors	5	Environment (Water Sources)			
	Depletion of water sources and deterioration of water quality				
		Water sources are unstable (there is no stable water source)	☐	☒	Among the well groups in Honiara constructed under the Japanese grant aid, it was noted that the Skyline and Titinge well groups had difficulties in securing the expected pumping rates. The cause was investigated in the JICA follow-up survey*4.
		Water sources are over-exploited (unsustainable)	☒	☐	
		Water sources are affected by pollution and climate change	☐	☒	High turbidity problem: Illegal logging or unmanaged logging activities can cause high turbidity (high levels of mud and soil particles) and water supply interruptions when it rains in the upper reaches of the Kongulai water source. The Kongulai water source accounts for about 50% of the water supply to Honiara City. The Government has not been able to crack down on illegal logging, etc. *9, 10 At Congrai spring, the raw water intake is unstable due to frequent blockage incidents at the raw water inlet (sinkhole) during heavy rainfall and flooding. *11 Continued heavy rain periods impacted on both our Kongulai and Kombito water sources, leading to periods of production shut downs due to high levels of turbidity at the source origin.*27 →It is reported that a turbidity reduction facility was constructed under the Japanese Government's grant aid, but that it has not been utilized well. The results of the JICA follow-up survey need to be confirmed. *24

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
	6	Government systems and politics			
		Tariff policy issues			
		No medium- to long-term basic policy for the country's water sector exists	☒	☐	It is the role of SIWA to formulate national policies relating to the control and use of urban water resources. The strategic plan for 2017 to 2047 was formulated. Water tariffs are revised by the Board members, who prepare revision proposals and have them approved by the MMWRE. This process will not change significantly after the SOE status is lost, but there may be some impact as the MMWRE will have the authority to appoint Board members. Water charges are very high, and it is recognized that non-revenue water and electricity costs have a major impact. It appears that the government is considering intervening in some way to lower electricity charges.(MMERE)
		The purpose of the subsidy is unclear	☐	☒	The subsidies are mainly for capital investments and tied to specific investments. Regarding government subsidies to SIWA, the MoF provides a fixed amount of subsidy to all SOEs every year in the form of Community Service Obligation (CSO). Therefore, before being excluded from SOE status, SIWA also received subsidies from the MoF. In addition, MMWRE also provides subsidies for specific SIWA projects, and 20 million SBD has been provided in 2023. 42 million SBD is scheduled to be provided in 2024. The former subsidy from the MoF will no longer be available if the SOE status is lost (MMERE).
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☐	☒	In August 2024, the cabinet of Solomon Islands Government decided to remove SIWA as a State-Owned-Enterprise for following reasons: Breach of contract: SIWA breached a number of contractual obligations, including service levels and deadlines for delivery, and misleading practices in financial transactions were reported. For sustainability of the operation, profitability is pursued. However, the removal from SOE position made it unclear for future position.
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc)	☒	☐	SIWA is responsible for construction of water and sewage infrastructure. Further, SIWA is allowed by Water Act 1992 to utilize their revenue for capital investment. However, a large portion of subsidy and DP grant is invested in the capital project. Recommendations for SIWA are Robust Revenue model, Financial Central, and Affordability to provide the service. If the service is good (especially for high turbidity measures), customers are willing to pay the bill.(MMERE)
		Regulation of water utilities does not function properly	☐	☒	Currently, SIWA has authority as both operator and regulator regarding water resource management, with the latter barely functioning. Therefore, a Water Resource Bill is planned to be created by amending the current River Water Act (established in 1962 to determine authority regarding the six rivers on Guadal canal), and is currently being drafted. Private well drilling companies are free to drill wells, but the Bill will regulate rights and licenses. It will apply to all water resources, including groundwater, not just rivers. The Water Resource Bill is expected to establish a new regulator within/directly below MMERE.(MMERE)
		The utility does not have the power to make personnel decisions	☒	☐	

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
	7	Development Partner (DP) Support			
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☐	☐	
		There is no continued donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☒	☐	- Panatina borehole: AUSTRALIA AND SOLOMON WATER CELEBRATE SUCCESSFUL COMPLETION OF PANATINA BOREHOLE PROJECT. Completed in May, 2023 *3 - SUCCESSFUL COMPLETION OF HONIARA WATER TANK AND LINER INSTALLATION PROJECT (May 2024) with funding coming from the Government of Australia and Solomon Water. ※16 - New Kongulai water treatment plant (15,000m3/d) project. Commission (now expected in Q2 2026). ※17, 18 → Ongoing support is provided by the Australian Government, ADB and WB. - In terms of cumulative project-based grants recorded in the BS, JICA accounted for 46%, the Australian Department of Foreign Affairs for 26% and ADB for 21%.
		No continued donor support for capacity development projects	☐	☒	DFAT has a track record of supporting the implementation of technical cooperation projects*23 As mentioned above, the main focus is on facility development, and the impression is that there are few technical cooperation-related projects. The development of a HR plan did not occur. The lack of the HR plan, combined with the other factors mentioned above, meant subsequent recruitment, training, retirement and career/succession plans also did not occur as intended. DFAT recommended that SIWA implements the key areas identified for strengthening organisational capacity.*23
		ADB support	☐	☐	• The Urban Water Supply & Sanitation Sector Project (UWSSSP) is being implemented with joint financing from ADB, WB and EU (including some grants), and facilities are being constructed and updated in four areas: Honiara, Tulagi, Auki and Noro (see ADB website). • As one of the components of Honiara, SIWA is constructing and laying a water treatment plant in Kongulai (after a meeting with ADB, SIWA confirmed that it is a water treatment plant that uses rapid filtration), a distribution reservoir and pipelines. The design water treatment plant in Kongulai has a capacity of 15,000m3/day, which is 40% of Honiara's water demand. Therefore, SIWA and Solomon Islands government agencies also consider it important. 25 million USD project. • However, the quality of the water treatment plant did not meet SW's requirements, so SW tried to • The UWSSP also includes projects related to the NRW, including the renewal of 10km of aging pipelines. In addition, sewer pipes are being laid in Panacena. • Some technology transfer will be carried out by incorporating consultants employed by the ADB into the Project Management Unit (PMU) (It seems more like construction management than technical cooperation related to the NRW). • The UWSSP is designed to prevent the debt burden from becoming too large by setting a ratio of 50% loans (40-year loan period, 10-year grace period, 1% interest rate, and 50% grant). Source: ADB interview
		DPs' fund	☐	☐	Grant 0662-SOL: Urban Water Supply and Sanitation Sector ProjectADBUS\$ 9.00 million Grant 0663-SOL: Urban Water Supply and Sanitation Sector ProjectEUUS\$ 20.35 million Loan 3826-SOL: Urban Water Supply and Sanitation Sector ProjectConcessional ordinary capital resources lendingUS\$ 28.00 million Loan: Urban Water Supply and Sanitation Sector ProjectWBUS\$ 15.00 million Grant 0801-SOL: Urban Water Supply and Sanitation Sector Project " Additional FinancingGEF-Least Developed Countries FundUS\$ 4.59 million https://www.adb.org/projects/51271-001/main#project-pds
		Project in Honiara	☐	☐	HONIARA WATER PROJECTS: 2019-2027 Component 1a: Water Supply System – US\$34.7 m Kongulai WTP – 15 Ml/d & rising main to Tasahe tanks; New reservoir at 3 sites (~3 MI each) to improve reliability of supply; New trunk mains to improve water transmission - 11.0km (225-400mm); Reduction of NRW losses – efficiency improvement (Future Design); Expansion of service – additional 40,000 people served (Future Design);
	8	Socioeconomic			
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate fluctuations, etc.)	☒	☐	The inflation rate recorded 5.9% in 2023
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☐	☒	- One of the reason of delay for implementation of project is due to land acquisitions*2 - There is also issue of land owners claims for compensation for the abstraction of water or access to water infrastructure.*2 e.g.) Appointment of Board and subsequent directives of Government. Majority of Board members are Public Officers. Increased political interference reduced governance and compliance*29
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☐	☐	The interest rate is too high for SW to borrow from commercial bank. The lending rate published by the central bank is 8.23% in June 2024.

Note: Blue colour indicates recommendation or plan in the existing documents and red colour indicate major issues identified by JICA Study Team through this analysis.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Source			
※	1	JICA無収水対策技プロ2016			
	2	Annual Report 2021			
	3	https://www.solomonwater.com.sb/index.php/resources/media-releases/183-australia-and-solomon-water-celebrate-successful-completion-of-panatina-borehole-project			
	4	改善計画フォローアップ2020			
	5	https://solomons.gov.sb/siwa-removed-from-soe-standing/			
	6	https://www.solomonstarnews.com/lilo-questions-removal-of-siwas-soes-status/			
	7	https://www.solomonstarnews.com/siwa-underperformed-removed-as-soe-explains-tovosia/			
	8	https://www.solomonwater.com.sb/index.php/resources/press-releases/107-solomon-water-cash-water-meter-program			
	9	https://www.solomonwater.com.sb/index.php/resources/media-releases/5-logging-in-the-kongulai-water-catchment-area			
	10	https://www.solomonwater.com.sb/index.php/resources/media-releases/73-continuous-heavy-rain-affects-kongulai-water-supply			
	11	ホニアラ市及びアウキ市給水設備改善計画報告書2008			
	12	https://www.jica.go.jp/oda/project/0960180/_icsFiles/afieldfile/2024/01/19/0960180.pdf			
	13	技プロの評価結果2016			
	14	solomon-islands-independent-eval-phase-2-urban-water-program (DFAT)			
	15	30YearStrategicPlanSummary			
	16	https://www.solomonwater.com.sb/index.php/resources/media-releases/235-solomon-water-celebrates-successful-completion-of-honiara-water-tank-and-liner-installation-project			
	17	https://www.adb.org/news/adb-world-bank-solomon-islands-initiate-groundbreaking-water-treatment-plant-upgrade#:~:text=HONIARA.%20SOLOMON%20ISLANDS%20(3%20February%202023)%20%E2%80%94%20The			
	18	https://www.adb.org/projects/51271-001/main			
	19	Solomon Water - Home			
	20	Solomon Islands Priority infrastructure investment pipeline 2021 Aug21_0			
	21	WB_Solomon-Islands-Urban-Water-Supply-and-Sanitation-Sector-Project_April2019			
	22	https://www.tavulinews.com.sb/landmark-agreement-resolves-kongulai-disputes/			
	23	solomon-islands-independent-eval-phase-2-urban-water-program2016			
	24	無償事業への会計検査報告2022			
	25	https://solomons.gov.sb/energy-minister-outlines-reasons-for-siwa-removal-from-soe-status/			
	26	20240724 Attachment 1 Board Decision Item 5.1 - SW Organisation Reform and Transformation Report - Final			
	27	20240724 Attachment 1 Board Decision Paper Item 5.3 - SW Half-Yearly Report 1 January to 30 June 2024 - Final			
	28	20240724 Attachment 1 Board Decision Paper Item 5.2 - SW 5-Year Corporate Strategic Plan 2024 - 2028 - Final			
	29	Questionnaire response received on Nov 4, 2024			

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

		1.017106375	1.099548746
SBD	Note	2022/12	2023/12 Composition
Revenue from contracts with customers	5	120,709,376	132,725,843
Other income (1)	6	19,863,651	13,505,211
Continuing operations		140,573,027	146,231,054
Corporate expenses (1)	7		16%
Depreciation and amortisation		(13,337,458)	(17,507,925) 14%
Salaries and employee benefits	8		30%
Impairment of financial assets	4①		8%
Repairs and maintenance			9%
Tools and uniforms			2%
Utilities			20%
Water treatment			1%
Expenses		(127,535,669)	(137,257,553)
Finance income	9(a)	138,831	778,869
Finance costs	9(b)	(3,237,147)	(2,886,589)
Net (loss) / profit for the year (1)		9,939,042	6,865,781
Other comprehensive income			
Other comprehensive income			
Total comprehensive (loss) / income for the year (1)		9,939,042	6,865,781
EBITDA		26,374,816	26,481,426
EBITDA Margin		21.8%	20.0%
EBITDA Margin excluding deferred income		7.6%	10.5%
ROA ((Continuting operations-Epenses)/total asset)		2.9%	1.2%
Ordinary profit margin(Profit Before Tax/Total income)		7%	4.7%
O&M coverage ratio excluding subsidies (%)		105.7%	110.8%
O&M coverage ratio (%)		120.8%	121.3%
Unit Cost of Water Supply (Currency/m³)		25	
Average tariff revenue(Currency/m³)		24	
Overall cost excluding depreciation expense		114,198,211	119,749,628
Overall cost including depreciation expense		127,535,669	137,257,553
Subsidies (000')		4,100,000	165,218
Development Partner grant support (000')		13,103,823	12,379,860
The ratio of subsidies and DP support to turnover		14%	9%

Source: Solomon island water authority.pdf

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 2)

1	Current NRW is 60.0% (Physical 45% and non-physical 15%) Reduced NRW is 40% (Physical loss 30% and non-physical loss 10%)
2	Reducing both physical and non-physical water losses

Financial benefits assuming reduction of NRW

				Compositio n of NRW
Actual	Total Water Produced (m3/annual)	15,155,481		
Actual	Production (m3/annual)	12,767,180	13,463,025	
Actual	Water sold (Revenue water) (m3/annual)	5,106,872	5,385,210	
Actual	NRW ratio (%)	60.0%	60.0%	
Assumed	NRW ratio by physical loss (%)	45%	45%	0.75
Assumed	NRW ratio by non-physical loss (%)	15%	15%	0.25
Calculated	NRW by physical loss (m3/annual)	5,745,231	6,058,361	
Calculated	NRW by non-physical loss (m3/annual)	1,915,077	2,019,454	
Assumed	Target NRW ratio (%)	40%	40%	
Assumed	Assumed NRW ratio by physical loss (%)	30%	30%	0.75
Assumed	Assumed NRW ratio by non-physical loss (%)	10%	10%	0.25
Calculated	NRW by physical loss (m3/annual)	3,830,154	4,038,908	
Calculated	NRW by non-physical loss (m3/annual)	1,276,718	1,346,303	
Calculated	Water saved from NRW reduction by physical loss	1,915,077	2,019,454	
Calculated	Water saved from NRW reduction by non-physical loss	638,359	673,151	

Unit cost and tariff rate (SBD/m3)			
Calculated	Unit cost (SBD/m3) -All expenses/sold water volume	25	25
Calculated	Unit cost (SBD/m3) -Expenses exclud depreciation/sold water volume	22	22
Calculated	Unit cost (SBD/m3) -Variable costs/sold water volume	8	9
Calculated	Unit price (SBD/m3)- Revenue from contracts with customers/sold water volume	24	25
Calculated	Revenue generated from NRW reduction by physical loss	45,266,016	49,772,191
Calculated	Revenue generated from NRW reduction by non-physical loss	15,088,672	16,590,730
Calculated	Total revenue increased and costs saved by NRW reduction	60,354,688	66,362,922
Total calculated income and expenditure (SBD/year)			
Calculated	Total Income	155,661,699	162,821,784
Calculated	Total expenditure before Depreciation	68,932,195	69,977,437
Calculated profits (SBD/year)			
Calculated	Operating Profit Before Depreciation	86,729,504	92,844,348
Calculated	Operating profits before finance costs	73,392,046	75,336,423
Calculated	Net (Loss) Profit Before Tax	70,154,899	72,449,834
Calculated	Profit (Loss) for the year	70,154,899	72,449,834

No variable date in 2022 and assumed as 8 in 2021

Note: Variable costs are Utilities and Repairs and maintenance

Financial indicators assuming NRW reduction (40%)

EBITDA	86,729,504	92,844,348
EBITDA Margin	56%	57%
EBITDA Margin(excluding deferred income)	56%	57%
O&M coverage ratio (excluding deferred income)	226%	233%
O&M coverage ratio(including all income)	226%	233%
ROA (Operating profit/asset)	2.1%	2.3%
Ordinary profit margin	45.1%	44.5%
EBITDA	26,374,816	26,481,426
EBITDA Margin	22%	20%
EBITDA Margin(excluding deferred income)	8%	11%
O&M coverage ratio (excluding deferred income)	106%	111%
O&M coverage ratio(including all income)	121%	121%
ROA (Operating profit/asset)	2.9%	1.2%
Ordinary profit margin	7.1%	4.7%

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnosis and Potential Solutions -

Jiro sy Rano Malagasy (JIRAMA)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

S. Overall Summary

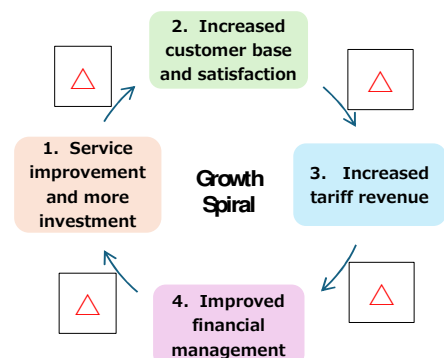
1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
- 3a. Bottleneck analysis (details)
0. Benchmarks

S. Overall Summary of Diagnostics and Potential Solution

Utility name : JIRAMA

Summary of Growth Spiral diagnostics*1

JIRAMA has been in difficult situation for sustainability of operation. The production capacity, production and population served have increased gradually. There is almost no spare production capacity available and much behind the water demand, which result in difficulty in increase of service coverage and continuity of services. The expand of production capacity along with distribution capacity may be an urgent issue to improve the water supply service. NRW remains high, which affect the water sales and exacerbate the financial conditions. The number of staff per 1000 connections is very low, seemingly indicating very efficient workplace, but according to JIRAMA, maintenance and management is inefficient, which may be caused by lack of human resources. Most financial indicators are negative and in deteriorating trend. **The overall growth spiral is not working well.**



*1: Refer to "4.GS diag"

Legend

- Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "3.Summary of bottleneck analysis"

1) Centralized management system (assumed)

JIRAMA is responsible for country-wide electricity and water provision and has many regional offices. Particularly, water supply cost varies by region due to different geographic feature. Management may not be delegated to each region.

2) Not improved NRW ratio

Although JIRAMA has a department responsible for NRW, it seems they have not produced the desired effect, leading to persistent high NRW ratio in the 50% range. According to JIRAMA, the main factors contributing to NRW include theft and leaks from old pipes with more than 50 years of service and the breakdown of old meters. Due to the deterioration, the water pressure has dropped, and the amount of water needed by residents is insufficient.

3) Insufficient maintenance

According to the questionnaire result, JIRAMA has reported a shortage of maintenance staff, inefficient maintenance practices, and a very low academic level of staff. The inability to create human resource development plans is also considered to contribute to inefficient maintenance. Consequently, this may lead to a decline in water service quality (decreased customer satisfaction) and a persistent high NRW rate.

4) Low Water Tariffs

The level of water tariffs is low, which does not lead to sufficient profits. Since 2017, JIRAMA has been applying for an increase in water tariffs, but due to recent inflation rates and other factors, the Ministry of Water and Sanitation has not approved it. As a result, there has been no change in water tariffs, and this has not led to an improvement in the financial situation.

<External factors>

5) Insufficient regulatory function

The regulatory body, SOREA, and the National Water and Sanitation Authority, ANDEA, seems to be not functioning well, which apparently lead to weakening of the governance of the water and sanitation sector in Madagascar.

6) Weak electrical power infrastructure

Frequent power outages are a major cause of limited operation of pumping facilities at water treatment plants and pumping stations. This is a major challenge for the expansion of water supply services.

Summary of Recommendations for Improvement

Refer to "5.Strategy analysis"

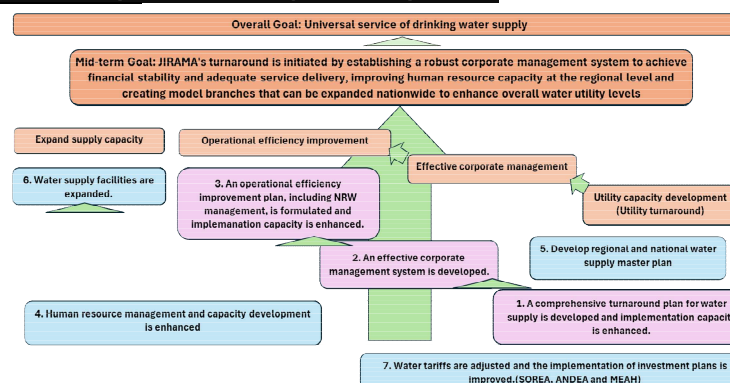
Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by low water tariff levels. Revenue from water sales is insufficient to cover even basic operation and maintenance (O&M) costs or to fund investments in water supply infrastructure. These challenges prevents JIRAMA from achieving service improvements.

As an initial step, a comprehensive turnaround plan for water supply should be developed, with an initial focus on the capital city. The following actions should be prioritized:

- Establishing a robust corporate management system integrated with performance monitoring mechanisms.
- Enhancing operational efficiency by reducing NRW and optimizing O&M practices, supported by human resource capacity development.
- Transforming and strengthening customer-oriented service
- Adjusting water tariffs while simultaneously strengthening the capacity of regulatory bodies (SOREA and ANDEA), which currently appear to be underperforming. (external factor)
- Enhancing organizational capacity within MEAH to improve governance and project execution. (external factor)
- Developing and implementing capital investment projects to initiate the turnaround, with active support from development partners (DPs).

Potential Solutions (Scenario for Improvement)

Refer to "6.Solution"



		MGA=	0.00022	USD
Source	A	Jan-25	0.03383	MGA
	B			
	C			
	D			
	E			
	F			
	G			
	H			

2. Analysis based on financial statements (FS analysis)

<External factors>

7) No cost-recovery level tariff due to the absence of tariff revisions for many years

The level of water tariff has been kept non-cost recovery level. Since 2017, JIRAMA has been applying for an upward revision of water tariffs due to inflation rates and other factors. However, the approval authority, the Ministry of Water and Sanitation, has not approved it. This has led to deterioration of financial situation.

8) Insufficient regulatory function and organizational capacity leading to low governance of water sector

The regulatory bodies, SOREA, and the National Water and Sanitation Authority, ANDEA, are not functioning, leading to concentrated authority in MEAH, causing governance confusion in Madagascar's water and sanitation sector. JIRAMA's water tariff revision has been stalled since 2017 due to MEAH's inaction. MEAH's budget execution is low, averaging 53% from 2015-2020, due to budget reshuffles and low absorption capacity, risking investment planning.

9) Weak electric power supply

Frequent power outages are a major cause of limited operation of pumping facilities at water treatment plants and pumping stations. This is a major challenge for the expansion of water supply services.

List of bottleneck analysis results and recommendations for improvement

No	Issues	Diagnostics	Recommendations for improvement
Internal Factors			
1.	Management and finance (assumed)		
	Issues with accounting consistency and transparency	Financial statements are on accrual basis, but electricity part and water part is not separated. This hinders in-depth analysis.	Effective corporate management system is developed with delegating the responsibility to regional office
	Low profitability	Unit cost of water supply is 1,663 Aryary/m ³ whereas the unit supply price is 939.8 Aryary/m ³ (0.21USD/m ³). The unit cost is higher than the unit supply price and does not make enough profit. JIRAMA plans to achieve operating break-even by recovering operating costs by 2028.	
	Challenges in the process of setting tariff	Uniform tariff setting regardless of region	
2.	Service provision and maintenance		
	The water supply coverage ratio and the population served are not growing.	Production and distribution capacity are largely insufficient in relation to growing demand. Service coverage has stagnated at a low level of 57.5% in 2021, 57.3% in 2022, and 55.9% in 2023, while the population is growing.	- Construction of new water treatment plants and tanks - Replacement of old pipes and old meters - Expansion of connection
	Insufficient infrastructure development	According to JIRAMA, most water transmission and distribution pipelines were more than 50 years old after installation. The ageing existing water transmission and distribution pipelines are considered to be one of the causes of high NRW. The inability to take effective countermeasures and adequately renew ageing pipelines has led to persistently high NRW rates.	
	High non-revenue water (NRW) rate	The NRW rate was high at 55.1% in 2023, mainly due to water theft, leaks from old pipes, and the breakdown of old meters. WB has supported JIRAMA for the improvement of NRW, but it is not sure whether it is effective.	Renew ageing water transmission and distribution pipelines. Need to check details of JIRAMA' approach for countermeasure and trends in support from other donors.
	High leakage rate	JIRAMA insists they have found many leakages. As the network's main pipes are very old, major breakages could deprive of water in several neighborhoods for a few days are occurring with increasing regularity.	
	Insufficient maintenance of facilities	Faced with major cash flow problems, JIRAMA has great difficulty in contracting with its suppliers. On-the-run management of chemical products does not allow production facilities to operate smoothly. What's more, regular stock shortages often mean that treatment dose have to be reduced, with the risk of producing water that does not meet drinking water standards.	Implementation of preventive maintenance and preparation of medium- and long-term maintenance plans.
	Water outage and unstable supply	Many towns in Madagascar have faced water shortage especially during drey season.	Expand water production capacity
	No DX utilization and low operational efficiency		
3.	Commercial Operations		
	Low customer satisfaction	Customer satisfaction is very low at 44.4% (2024), and there are many challenges to resolve.	Development of an organization for the provision of customer-oriented services.
	Low collection rate		
4.	Organization and Human Resource Management		

No	Issues	Diagnostics	Recommendations for improvement
	Shortage of engineers and skills gap	According to JIRAMA's response to the questionnaire, the current level of engineers is low and there are not enough of them. There is also no systematic training in place.	Preparation of human resources development plans and training of engineers and technicians. Strengthening the financial capabilities of regional offices
	Reducing organizational efficiency	JIRAMA faces a long-standing staffing issue, worsened by recent organizational changes. The Antananarivo Operations Division has a 52% coverage rate, with 206 staff short of the target. To fill this gap, JIRAMA uses temporary staff, who often lack qualifications and experience, leading to high turnover and inefficiencies. This reliance negatively impacts the department's objectives and water quality, despite the significant payroll cost of these temporary workers.	
	Lack of strategic management capabilities in the organization	KPIs are used to manage and improve regional office operations. The current management aims to centralize financial functions and appoint regional focal points for financial matters. JIRAMA uses an ERP system for financial transactions, but the CFO highlights that data input quality is the main issue.	
	Lack of planning		
	Governance issues	JIRAMA is undergoing its third reorganization in eighteen months to streamline the organizational chart and reduce hierarchical levels. While the goals align with the performance contract, this frequent restructuring destabilizes departments. Stabilizing the organization and allowing time to see benefits is crucial. Clear communication of objectives and missions to managers is also necessary to address current concerns and ensure smooth operations. The CFO is concerned about audit delays and emphasizes timely financial reporting for decision-making. Delays are due to management changes affecting structure, procedures, and controls. Internal coordination issues and a history of financial mismanagement also cause delays and supplier hesitance.	Stabilize the organization and ensure clear communication of objectives and missions to managers.
External factors			
5.	Environment (Water Sources)		
	Depletion of water sources and deterioration of water quality	In particular, water depletion is caused during the dry season. According to JIRAMA's response to the questionnaire, the rate of compliance with water quality standards is high, but it is unclear whether the water quality level is actually satisfactory for customers. JIRAMA tends to be greatly affected by natural disasters such as the cyclone that hit in early 2022.	
6.	Government systems and politics		
	Hindering self-sustaining operations	The regulatory body (SOREA) and The National Water and Sanitation Authority (ANDEA) are not functioning. As a result, authority is concentrated in MEAH. This concentration of authority is a factor in the confusion of governance within the water and sanitation sector in Madagascar. Despite JIRAMA having applied to revise its water tariffs since 2017, it has not been able to do so because the MEAH has not authorized it. MEAH's budgetary credibility is limited, with project execution averaging only 53% from 2015-2020. This low execution rate is due to budget reshuffles by the Ministry of Economy and Finance and MEAH's low absorption capacity. This poses a risk to investment planning, which may quickly become obsolete. To address this, MEAH should revise the planning of SAEP improvement works at least every three years.	Strengthen regulatory bodies (SOREA and ANDEA) and enhance organizational capacity within MEAH to improve governance and project execution.
	Challenges in Water Supply Policy		
7.	Development Partner Support		
	Lack of development partner support		
8.	Socioeconomic Finance		
	Socioeconomic Impact	Inflation rate is high at 8.16% in 2022 and 9.86% in 2023. Madagascar has one of the lowest infrastructure access rates globally, with only 33.7% of the population having electricity (2020). Despite expanding power generation in 2023, frequent power cuts persist due to structural problems such as dilapidation, saturation of Jirama's distribution network and vulnerability to bad weather.	
	Lack of financial resources		

*1 L: Minor issue; M: Moderate issue; H: Major issue

*2 Urgent: within 6 months; Short-term: within 2 years; Medium-term: within 5 years; Long-term: 5 years or more

4. Diagnostics based on Growth Spiral (GS diag)

Overall diagnostics of growth spiral

JIRAMA has been in difficult situation for sustainability of operation. The production capacity, production and population served have increased gradually. There is almost no spare production capacity available and much behind the water demand, which result in difficulty in increase of service coverage and continuity of services. The expand of production capacity along with distribution capacity may be an urgent issue to improve the water supply service. NRW remains high, which affect the water sales and exacerbate the financial conditions. The number of staff per 1000 connections is very low, seemingly indicating very efficient workplace, but according to JIRAMA, maintenance and management is inefficient, which may be caused by lack of human resources. Most financial indicators are negative and in deteriorating trend. The overall growth spiral is not working well.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?					
Diagnosis result	The spiral is not working well. -The production volume have only slightly increased, but both the production capacity and the service coverage declined. - The utilization ratio of production capacity is almost 100%. The continuity of service declined to a maximum of 16 hours/day in 2022 from 24 hours in 2021 with regional diffrence (2 to 16hours). This indicates the need for expansion of water production capacity. - The quality of water supply has high compliance but questionable. The water supply pressure is not high.				

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
9	Population served	4,081,410	-	-	3
10	Service coverage / Water coverage (%)	55.9	2	↘	3
11	Customer satisfaction (%)	44.4	1	↘	
12	Water sold (m ³ /day)	215,967	-	→	3
13	Water consumption per capita per day (L/c.a/day)	52.9	-	-	

Customer satisfaction is 2024.

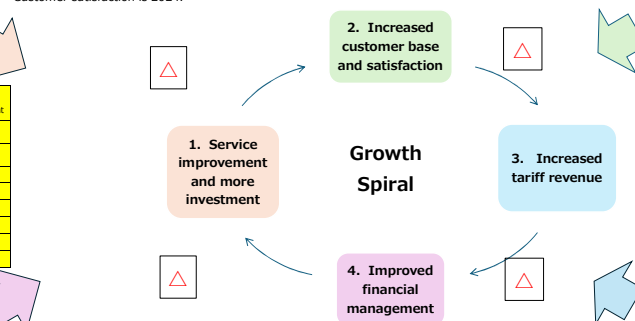
(2→3) Is the increase in the number of customers leading an increase in tariff revenue?					
Diagnosis result	- The growth spiral is not working well. - Both the collection ratio and the metering ratio have reached to 100%, but meter is obsolete. The NRW ratio remains as high as 55.1% in 2023. This hinders increase in revenue from water.				

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
1	Investment cost (Currency)	NA	-		
2	Production capacity (m ³ /day)	403,654	-	↘	2
3	Production (m ³ /day)	392,220	-	↗	2
4	Utilization ratio of production capacity (%)	97%	-	→	
5	Continuity of Service (Hrs/day)	16	2	↘	
6	Quality of water supplied (Compliance rate: %)	94	3	?	
7	Water supply pressure	65%	-	↘	
8	Leakage ratio (%)	NA	-	0	

The year of Investment cashout is 2021.

(4→1) Is the financial improvement leading to investment activities?					
Diagnosis result	-The spiral is not working well. The water production capacity is not enough for near future. Most financial indicators are negative and in decreasing trend, which does not invest infrastructure by own fund, heavily relying on development partners grant and loans.				

Legend	Note:
○ Working well	The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.
○ Working	
△ Not working well	



KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
14	Turnover	74,086	-	↘	4
15	Collection ratio (%)	110	4	↗	
16	Non-revenue water ratio(%)	45.0	1	→	6
17	Metering ratio (%)	100	4	→	
18	Water tariff level	NA	-	0	4

KPI #	KPI	Data (2023)	Stage of growth	Trend	Steps for improvement
19	Accounting system	IFRS	-	-	1
20	Net income (Currency)				5,7
21	EBITDA (Currency)				
22	EBITDA margin (%)				5,7
23	EBITDA margin excluding deferred income (%)				5,7
24	Total capital operating margin (%)				
25	Operating Profit Margin(%)				
26	Equity ratio (%)				
27	Fixed long term conformity rate (%)				
28	O&M cost coverage ratio (%)				5,7 USD
29	O&M cost coverage ratio excluding subsidies (%)				5,7
30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)				0.36
31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)				0.20
32	Subsidies (Currency)				
33	Development Partner grant support (Currency)				
34	The ratio of subsidies and DP support to turnover				
35	Number of staff per 1,000 connections	NA	NA	→	

1MGA= 0.000216 USD

(3→4) Is the tariff revenue improvement leading to financial improvement?					
Diagnosis result	- The spiral is not working well. - JIRAMA does not generate enough revenue to cover O&M cost. - The number of staff per 1,000 connections seems an efficient level with a low number, while JIRAMA responded to the questionnaire that the number of permanent agents operating in the water sector is insufficient.				

5. Strategy analysis

Medium- to long-term direction of the water utility

The article 37 of the code of water 1999 stipulate that the universal service of drinking water supply is the attribute public service based on the obligation to provide all users with a minimum quantity and minimum service of drinking water.

Direction *1

The decree in 2017 stipulates the scope of responsibility is the operation of drinking water supply centres, including water production, transport and distribution in the concession contract, signed in 2017.

In the section of water activities in the 2022 and 2023 activity reports, JIRAMA stated that “The securing of operations has been designed to ensure continuity of operations during normal periods, low water levels, and cyclone seasons.”

The following are listed as major activity items in the reports:

- a) Water Resources and Civil Engineering
- b) Electro-mechanical Installations
- c) Water Quality

KPIs *2

JIRAMA has set the following KPIs and is monitoring them:

- a) Quality of water
- b) Availability of water
- c) Efficiency (billing/production)
- d) Connection
- e) Delay of treatment of claims

Degree of achievement: 50%

In addition, JIRAMA does not have a PDCA cycle of regular evaluation and feedback.

Objectives in JIRAMA budgeted framing 2025 *3

- JIRAMA plans to achieve cost recover by the end of FY2028.
- Improve customer satisfaction (customer experience)

Suggestions for improvement

Overall goal:

Set or publicly disclose JIRAMA's visions and missions for water based on its medium- to long-term strategy, which will be the overall goal linked to the mid-term goals of this study below.

Mid-term goal:

JIRAMA's turnaround is initiated by establishing a robust corporate management system to achieve financial stability and adequate service delivery, improving human resource capacity at the regional level and creating model branches that can be expanded nationwide to enhance overall water utility levels.

Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by low water tariff levels. Revenue from water sales is insufficient to cover even basic operation and maintenance (O&M) costs or to fund investments in water supply infrastructure. These challenges prevents JIRAMA from achieving service improvements.

As an initial step, a comprehensive turnaround plan for water supply should be developed, with an initial focus on the capital city. The following actions should be prioritized:

- Establishing a robust corporate management system integrated with performance monitoring mechanisms.
- Enhancing operational efficiency by reducing NRW and optimizing O&M practices, supported by human resource capacity development.
- Transforming and strengthening customer-oriented service
- Adjusting water tariffs while simultaneously strengthening the capacity of regulatory bodies (SOREA and ANDEA), which currently appear to be underperforming. (external factor)
- Enhancing organizational capacity within MEAH to improve governance and project execution. (external factor)
- Developing and implementing capital investment projects to initiate the turnaround, with active support from development partners (DPs).

The turnaround plan should incorporate ongoing water facility projects by the World Bank and the European Investment Bank (EIB), along with their technical assistance, to achieve a collective impact in coordination with other DPs.

Steps to make Growth Spiral work

<Improve management and operation at the regional level and create a model branch>

1. Develop the implementation capacity of comprehensive turnaround plan for water supply
2. Develop an effective corporate management system
3. Improve operation efficiency

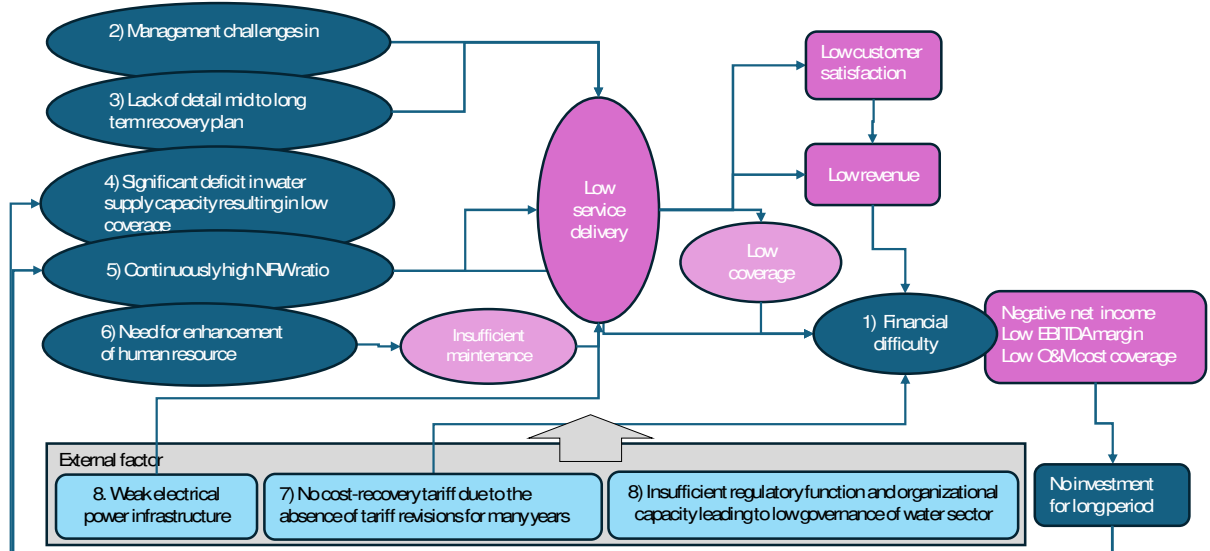
<Extend a model to nationwide>

4. Turn around and establish a model branch
5. Use the model branch as the centre to expand and enhance the level of water utilities across the country.

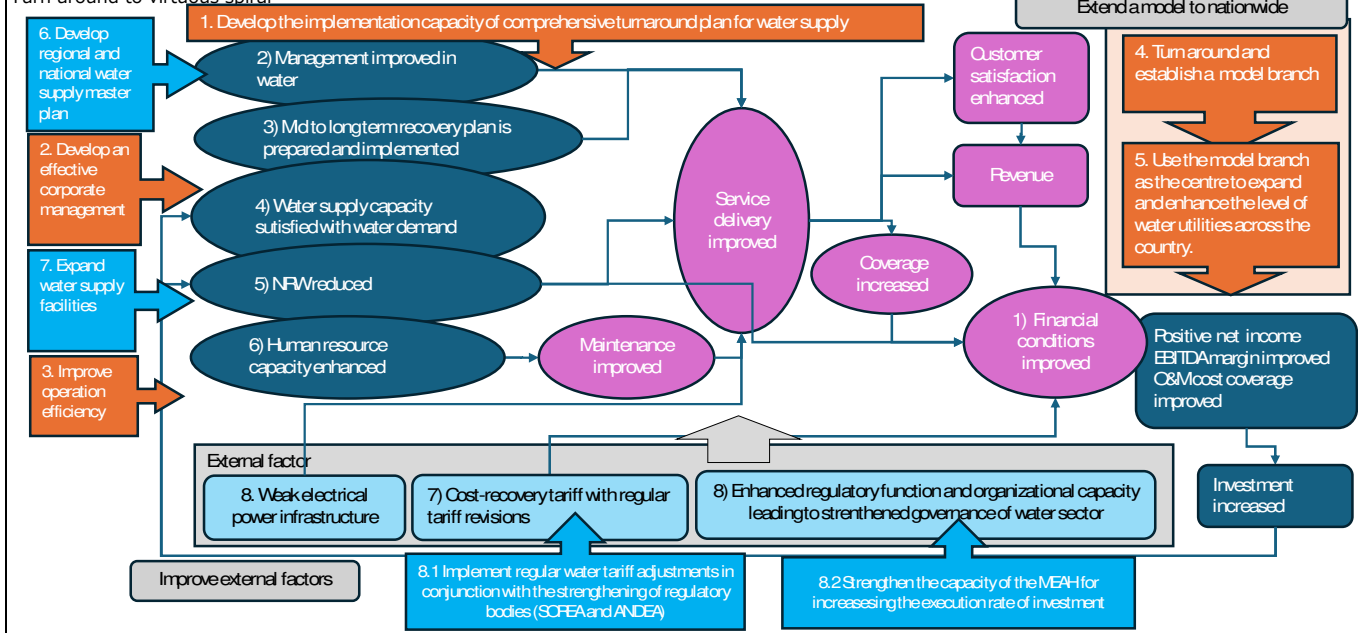
<Improve external factors>

6. Develop regional and national water supply master plan
7. Expand water supply facilities
- 8.1 Exercise regular water tariff adjustment in conjunction with the strengthening of regulatory bodies (SOREA and ANDEA)
- 8.2 Strengthen the capacity of the MEAH for increasing the execution rate of investment plans

Vicious spiral



Turn around to virtuous spiral



*1 RAPPORT D'ACTIVITES JIRAMA 2023

*2 JIRAMA's responses to this project's questionnaire recorded on 8 Nov 2024

*3 JIRAMA Budget framing 2025

6. Potential Solutions

Goals	
Overall Goal	Universal service of drinking water supply
Mid-term Goal	JIRAMA's turnaround is initiated by establishing a robust corporate management system to achieve financial stability and adequate service delivery, improving human resource capacity at the regional level and creating model branches that can be expanded nationwide to enhance overall water utility levels.

Outcomes		Indicator	Target		
	Outcomes		Base line	2030	Long term
1	A comprehensive turnaround plan for water supply is developed and implementation capacity is enhanced.				
2	An effective corporate management system is developed.				
3	An operational efficiency improvement plan, including NRW management, is formulated and implementation capacity is enhanced.	NRW (%)	45		
4	Human resource management and capacity development is enhanced.	Annual distance of network			

External factors (with the ministry)

5	Develop regional and national water supply master plan				
6	Water supply facilities are expanded.				
7	Water tariffs are adjusted and the implementation of investment plans is improved.(SOREA, ANDEA and MEAH)				

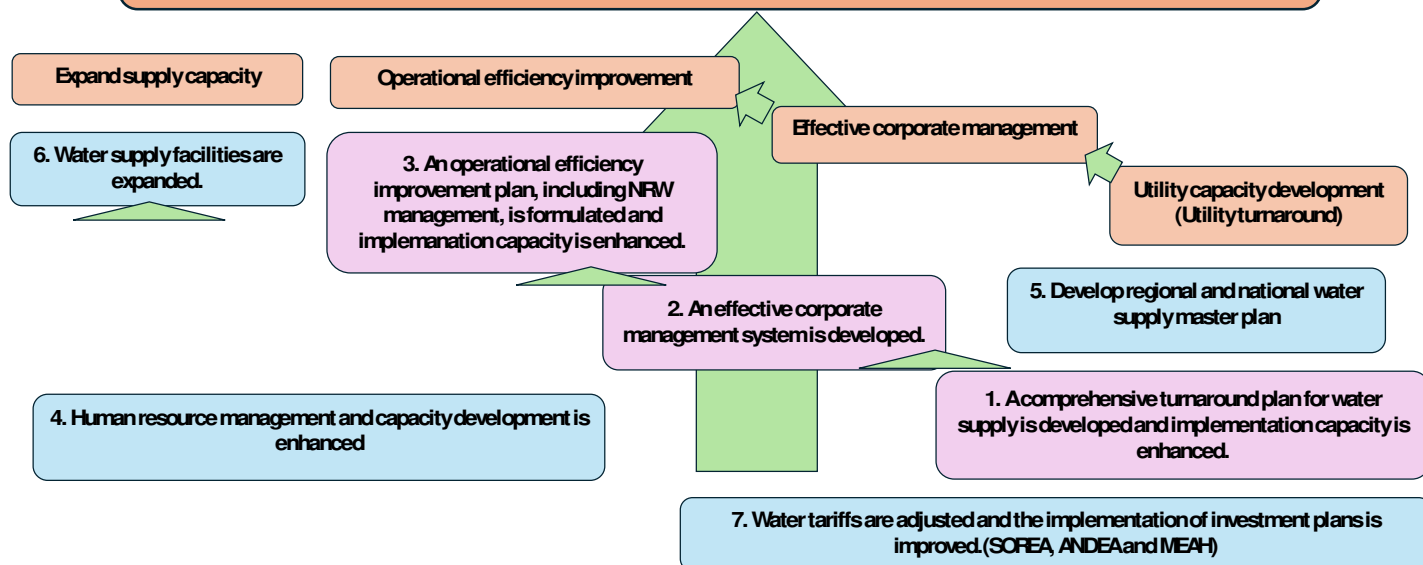
Activities		DPs	Target	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	Long-term
1	A comprehensive turnaround plan for water supply is developed and implementation capacity is enhanced.									
	1 Assess management capacity of JIRAMA for water supply		Urgent							
	2 Formulate a turnaround/recovery plan for JIRAMA (infrastructure development and operation, and improvement of operation and financial conditions, human resource development, customer-oriented service)		Urgent							
	3 Enhance implementation capacity of turnaround plan		Medium							
2	An effective corporate management system is developed.									
	1 Develop the planning including setting KPIs with measure to achieve the KPI		Urgent							
	2 Strengthen branch office's financial and operational management system which enables KPI monitoring		Urgent							
	3 Introduce performance-based management system of branch offices with technical and financial KPIs		Medium							
3	An operational efficiency improvement plan, including NRW management, is formulated and implementation capacity is enhanced.									
	1 Assess existing operational efficiencies		Short							
	2 Formulate/update NRW management plan based on the previous World Bank project		Short							
	3 Implement NRW management plan		Medium							
	4 Replace aging transmission and distribution pipelines		Medium							
4	Human resource management and capacity development is enhanced.									
	1 Efficient human resources plan is developed		Short							
	2 KPI and performance management of human resources is implemented		Medium							
	3 Training system with meritocracy is implemented		Medium							

External actions (with the ministry)												
5	Develop regional and national water supply master plan											
	1	Develop master plan for the major cities/areas		Medium								
	2	Develop financing strategy to mobilize fund for the major investment		Medium								
6	Water supply facilities are expanded.											
	1	Review existing plans and examine other donors' activities for water supply facilities.		Short								
	2	Conduct surveys for the development of of new water resources and construction of facilities.		Short								
	3	Construct new water supply facilities.		Medium								
7	Water tariffs are adjusted and the implementation of investment plans is improved.(SOREA, ANDEA and MEAH)											
	1	Analyze detail bottlenecks to hinder tariff rate adjustment and excution of ivestment plans		Urgent								
	2	Set up required institutions and guidelines for tariff rate adjustment, ensuring regulatory bodies (SOREA and ANDEA) are strengthened.		Urgent								
	3	Exercise tariff rate adjustment		Medium								
	4	Improve the organizational capacity within MEAH to ensure better governance and effective execution of investment plans.		Medium								

Scenario of Improvement

Overall Goal: Universal service of drinking water supply

Mid-term Goal: JRAMA's turnaround is initiated by establishing a robust corporate management system to achieve financial stability and adequate service delivery, improving human resource capacity at the regional level and creating model branches that can be expanded nationwide to enhance overall water utility levels



3a. Bottleneck analysis (details)

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
Internal Factors	1	Management and finance			
	Accounting consistency and transparency issues				
		Financial statements are made not on the accrual basis of accounting.	☐	☒	Financial statements are on accrual basis, but electricity part and water part is seemingly not fully separated. This hinders in-depth analysis for water only. The operation of the electrical part seems to be favored at all levels, cash flow problems are seriously affecting the water business. It is essential that JIRAMA quickly set up separate accounting.*12
		There is no fixed assets register for financial management	☐	☐	It is seemingly registered. But according to questionnaire, the government owns part of the infrastructure asset.
	Low profitability				
		The water revenue is insufficient to recover O&M costs.	☐	☒	JIRAMA does not generate enough revenue to cover O&M cost in both electricity and water, although water revenue only account for 9-10%. Investment is made more than depreciation level. Although JIRAMA is a public utility, all its purchases subject to customs duties and taxes. This system puts a strain on the accounts of an already fragile company. JIRAMA's high level of supplier debt is creating operating problems that are undermining the company. Indeed, as a result of this debt and the difficulties encountered by JIRAMA in paying its suppliers, they no longer trust the company and are even refusing to respond to calls for tender. As a result, JIRAMA is in a permanently precarious situation, unable to build up a minimum stock of its most strategic inputs. *12 JIRAMA plans to achieve operating break-even by recovering operating costs by 2028 *13
		The water revenue is insufficient for full-cost recovery including investment cost	☐	☒	Unit cost of water supply is 1,663 Aryary/m3 whereas the unit supply price is 939.8 Aryary/m3. The unit cost is higher than the unit supply price and does not make enough profit. The Code of water stipulates in Article 54 on the pricing and cost recovery policy for drinking water services and sanitation must respect the following principles: - Access to the public water service, whether at water points collective or individual connections, is chargeable; - for each water and sanitation system, the applicable rates must enable the financial balance of system managers and tend towards full cost recovery; - investment and operating costs, on the one hand, and the capacity to payment - users, on the other hand, are taken into account in the principles of water pricing and setting of sanitation charges; - products collected by project owners and managers for drinking water and sanitation services are revenues allocated to these services alone; - Tariff systems must include provisions allowing access to universal drinking water service for consumers domestic workers with the lowest incomes.
		Unit price of water supply is low	☐	☐	
		Unit cost of water supply is high	☐	☐	
	Process for setting water tariff is not in place				
		Water tariff is not reviewed on a regular basis	☐	☒	The water tariff is managed by the government. The tariff is very low level. *4 The current water tariff (Jirama DG/DPS 29 June 2017) was approved in June 2017, but since then, there have been no revision to JIRAMA's water tariffs. The possible reason for this is that the regulatory authority, the Ministry of Water, Sanitation and Hygiene(MEAH), has not approved the tariff revision requests from JIRAMA. Although the MEAH recognizes the need for an tariff adjustment, they have been cautious about raising water tariffs due to the recent economic downturn, and there is no clear timeline for when the price increase might
		Water tariff is not revised in response to increases in operating costs such as inflation	☐	☒	Ditto
	Insufficient planning and investment funding shortage				
		No business operation plan and facility development plan have been prepared.	☐	☐	
		No financial projection of short to long term funds	☐	☐	
		High reliance on external funding such as subsidies in multi-year business plans	☐	☐	Investment is made more than depreciation level. However, there is dependence on government subsidy.
	2	Service provision and maintenance issues			
	The water supply coverage ratio and the population served are not growing.				
		The water supply coverage ratio and the population served are not growing.	☐	☒	Service coverage has stagnated at a low level of 57.5% in 2021, 57.3% in 2022, and 55.9% in 2023, while the population is growing. Several areas in the upper parts no longer have water during dry season. Some others only have at night. Frequent water cuts and lack of pressure at the ends of the lines. *4
	Insufficient infrastructure development				
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☐	☒	Production and distribution capacity are largely insufficient in relation to growing demand. Production faults resulting in a significant drop in volume lead to shortages of water in neighborhoods and provoke major protests *12
		Development of new facilities is not progressing			
		There is a lot of aging infrastructure	☐	☒	Most of the pipes and meter are obsolete. More than 50 years of service. *4 Due to the inadequate supply of existing water plants and aging water pipe networks, residents are not receiving the necessary amount of water due to leakage and insufficient water pressure, and are at risk in terms of water quality. *3 The vast majority of the customer meter park is over 30 years old. 20 to 30% of the park would be faulty (illegible - blocked).*12
	High non-revenue water (NRW) rate				
		Water balance not calculated	☐	☐	JIRAMA plans to improve NRW ratio from 45% (2024) to 42% (2025) *13 The existing distribution network has commercial losses estimated at 22%, plus physical losses of the same order (22%) *12
		High commercial loss	☐	☒	Commercial losses are very high *4 The meter readers, who are on foot and have to distribute bills at the same time, tend to prefer electricity meters to water meters, which often harder to reach. As a result, billing is not necessarily representative of actual consumption *12
		There is no specialized department for managing non-revenue water.	☒	☐	There is a section responsible for NRW management, having an action plan for reducing NRW.*4
		There is no plan to reduce non-revenue water, and no measures have been implemented.	☐	☒	Measures through DMAs have been implemented and illegal connections have been tackled. *4 Major causes of NRW: leakage due to aged pipeline, illegal connection*10 To reduce physical losses and optimize distribution, it is essential to take into account all the components that make up the drinking water service. For this reason, a comprehensive action plan should be drawn up, covering the entire supply value: securing and reinforcing production systems, zoning, renewal of meters, knowledge of assets and leak detection, long-term planning for system renewal, and consolidation of internal reading, control and billing procedures.*12
	High leakage rate				

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Many leaks are caused by deterioration of water pipes	☐	☒	Most of the pipes and meter are obsolete. More than 50 years of service. *4 As the network's main pipes are very old, major breakages could deprive of water in several neighborhoods for a few days are occurring with increasing regularity *12
		Leak detection is not being carried out systematically	☐	☒	The following are the most common complaints from customers. Water cut, Lack of pressure, Meter problem, Leak on pipes , Billing problem.*4 The team attached to the Distribution Department is responsible for leak detection in the field. Although its activity is supposed to cover the whole of JIRAMA's territory, its current field of action is exclusively Greater Antananarivo.*12 As a result, there is currently no leak detection program, and the team's interventions are based mainly on feedback from the agencies that receive customer complaints.*12
		Water pressure distribution is not controlled	☐	☒	The production and distribution capacity are largely insufficient in relation to growing demand. The approximate percentage of the customers in low water pressure area was high at 55% in 2021 as well as 2022 and 65% in 2023. Many cuts and lack of water pressure, low quality of service.*4
		Insufficient maintenance			
		There is no up-to-date facility inventory for facility O&M	☐	☒	JIRAMA does not have a very detailed inventory of its assets, such as the age of infrastructure or the number of breakdowns. While there is internal counting and verification of assets, it lacks comprehensive details, such as the condition of individual components like pipes. *15
		Regular maintenance of equipment is not carried out	☐	☒	Lack of periodic maintenance and serving of infrastructures. *4
		No budgeted maintenance plan	☐	☒	Faced with major cash flow problems, JIRAMA has great difficulty in contracting with its suppliers. This generates permanent tension in operations, and can even lead to crisis situations during the Covid period (2020/2021) with the lack of alumina sulfate.*12 On-the-run management of chemical products does not allow production facilities to operate smoothly. What's more, regular stock shortages often mean that treatment have to be reduced, with the risk of producing water that does not meet drinking water standards *12
		No DX implementation and low operational efficiency			
		There is no strategy for implementing digital transformation	☒	☐	There is a strategy of introducing of Digital Transformation.*4
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases, smart meters)	☒	☐	Digital technologies are used. *4 Payment method: Mobil bank, cash to the agency, bank transfer *4 JIRAMA uses QGIS to manage water facilities *12
	3 Commercial Operations				
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☐	☐	
		There is no established process for handling complaints, or there are problems with handling complaints	☒	☐	There is a department responsible for collecting customer complaints (call center). The complaints are transmitted to the technical services which handle them in order to priority. After processing, technical services update the trouble shooting data in the system. *4 No customer satisfaction surveys were conducted in 2021-2023.*4
		Low collection ratio			
		The water tariff collection process (including unpaid fees) is not effective/efficient	☐	☒	JIRAMA wants to replace meters with prepaid and smart meters to improve collection rate.*4 Refer below.
		The payment method is inconvenient for customers (customers have some complaints)	☐	☒	The following are the most common complaints from customers. Water cut, Lack of pressure, Meter problem , Leak on pipes , Billing problem . *4
	4 Organization and Human Resource Management Issues				
		Shortage of engineers and skills gap			
		There is a shortage of engineers with specialized knowledge	☐	☒	The number of permanent agents operating in the water sector is insufficient. Lack of engineers. *4 JIRAMA around 5,800 people, distributed as follows: ■ 44% for shared services ; ■ 40% for electricity ; ■ 16% for water *12 This staffing problem seems to have been a structural one for many years, but it has now been exacerbated by the implementation of the new organization, which has reshuffled the deck and led to staff being transferred from one entity to another, the positions thus "freed up" being filled. In the case of the Antananarivo Operations Division ("Water opérations Antananarivo"), the current shortfall is 206 staff against a target of 431, representing a coverage rate of just 52%. Part of this staff shortfall is covered by temporary staff. Such a situation is excessively detrimental to achievement of this department's objectives, both in terms of production/distribution and the quality of water delivered to consumers.*12 Temporary workers: JIRAMA uses a staffing company for a number of tasks, including operating tasks.On a regular basis, these staff do not have the necessary qualifications to carry out their tasks under the best conditions, particularly on production facilities. These staff have a high turnover , they often don't fit in with at their workstations. This staff is not counted as JIRAMA manpower even though they are represents a significant payroll. *12
		No skills and training strategy or plan	☐	☐	same as below.
		Regular training and development programs are not provided adequately.	☐	☒	Lack of training, although the following trainings are provided. - Basic training in electromechanics and hydroelectric - Leak detection - Project management - Sectorization and DMA - Digitalization and Remote Management *4
		Declining organizational efficiency			
		There is no annual evaluation and goal setting system for staff	☒	☐	JIRAMA has an annual appraisal and target setting system for managers as well as all staff. *4
		Performance-based rewards and promotions are not implemented in the personnel system	☒	☐	
		No power to hire and fire staff (within the bounds of an agreed plan)	☒	☐	As part of the recruitment process, the HR department is obliged to publish a job for each open position. Once the offer has been validated, the job descriptions are published on the JIRAMA website, on social networks and in the local press. Each candidate is invited to put together an application file, and an internal HRD committee makes an initial selection. Once the most interesting applications have been selected by the HR department, applicants are interviewed by both HR department representatives and the heads of the departments to which they could be recruited. *12
	Lack of strategic management capabilities in the organization				

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Not setting and monitoring enough Key Performance Indicators	☒	☐	JIRAMA has set the following KPIs and is monitoring them: a) Quality of water b) Availability of water c) Efficiency (billing/production) d) Connection e) Delay of treatment of claims Our age pyramid takes the shape of a mushroom, with an older population and 53% of employees aged over 45. Only 13% of the workforce is female*11 KPIs are used to manage and improve operations at regional offices.*14 The current management's goal is to centralize the financial function and designate a focal point in each region to focus on financial matters. JIRAMA uses an ERP system to record financial transactions. While an upgrade to the IT system is strongly recommended, the CFO emphasizes that the real issue lies not in the system itself, but in the data inputted by users.*15 Regional Activity Supervision: -Monthly reporting from each region. -Daily exchanges via WhatsApp between on-site agents and central agents to monitor real-time site conditions. -The Management Control Department analyzes KPIs such as efficiency and production trends for both water and electricity, then submits them to the CEO based on the monthly reports.*16
		Specific targets and deadlines associated with each strategic objective are not clearly defined.	☐	☒	
		There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☐	☒	There is no annual evaluation and feedback cycle of Plan, Do, Check, and Action (PDCA) *4
		Governance issues			
		Important decision-making processes are not clear and are not made in a collegial manner.	☐	☒	The CFO expressed concerns about the delay in the audit process, noting that financial reports should be submitted on time to facilitate decision-making. The delays are partly due to ongoing management changes, which have affected the organizational structure, procedures, and internal controls.*15 One key issue lies in JIRAMA's internal coordination, particularly delays in decision-making. Additionally, JIRAMA's history of financial mismanagement has led suppliers to hesitate in responding to its calls for tenders. A delay in financial reporting has also been observed—for example, the 2022 financial report was only submitted in October 2024. To address these challenges, decentralizing JIRAMA's management is necessary.*17

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		The division of responsibilities within the organization is not clear.	☐	☒	JIRAMA is in the midst of a reorganization aimed at clarifying the organizational chart and reducing the number of hierarchical levels. Although the objectives are laudable and in line with the performance contract, this reorganization, the third in eighteen months, is once again destabilizing the activities of all departments and services. To enable JIRAMA to carry out its tasks with complete peace of mind, it is essential to stabilize the organization and give it time to demonstrate its full benefits. It is also necessary to explain to all managers the objectives of this organization and the missions of each. In this way, managers will be able to pass on this information to their teams, and current questions and concerns can be allayed.*12
External factors	5	Environment (Water Sources)			
		Depletion of water sources and deterioration of water quality			
		Water sources are unstable (there is no stable water source)	☐	☒	The water scarcity suffered by many towns in recent years during the dry season calls attention to the lack of water resources management at a national scale, as existing surface water sources are drying up and the potential for groundwater is not well known. *2
		Water sources are over-exploited (unsustainable)	☐	☐	
		Water sources are affected by pollution and climate change	☐	☒	The country's high vulnerability to natural disasters, exacerbated by climate change, including increased variability and severity of cyclones, floods, and droughts, is increasing the fragility of food and energy systems and jeopardizing food security over time. In early 2022, repeated cyclones inflicted heavy damage to housing and critical public infrastructure – roads, bridges, rail network, electricity and water supply systems, classrooms, and health centers. *2 Madagascar is particularly vulnerable to natural disasters and is among the top five countries most vulnerable to climate change globally, with serious socioeconomic consequences. *2 Air and water pollution, resulting from transportation, industries, poorly managed urban waste, deforestation, floods, and bush fires, also contribute to environmental degradation and global warming, degrading the quality and availability of water resources. *2
	6	Government systems and politics			
		Tariff policy issues			
		No medium- to long-term basic policy for the country's water sector exists	☒	☐	During the interim period between two five-yearly reviews provided for in article 9 of the present decree, the tariff levels may be automatically adjusted each year by the Water System Operator, by applying an adjustment formula determined by the Regulatory Body. *5
		The purpose of the subsidy is unclear	☒	☐	
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☒	☐	
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc.).	☒	☐	
		Regulation of water utilities does not function properly	☐	☒	JIRAMA is under the supervision of three ministries: -Ministry of Energy and Hydrocarbons -Ministry of Water, Sanitation and Hygiene(MEAH) -Ministry of Economy and Finance The regulatory body (SOREA) is responsible for determining service charges and monitoring their correct application, as well as proposing specific standards. The regulatory body is not functioning. The National Water and Sanitation Authority (ANDEA) was established for the Integrated Water Resources Management (IWRM approach) and rational development of the water and sanitation sector, as well as to coordinate stakeholders. This organization is also not functioning. As a result, authority is concentrated in MEAH. This concentration of authority is a factor in the confusion of governance within the water and sanitation sector in Madagascar.*1 According to the legislation, it is the MEAH that has the authority to grant approval for water tariffs. JIRAMA is required to set water tariffs in accordance with the provisions of the Water Code and relevant decrees and to obtain approval from the MEAH. Despite JIRAMA having applied to revise its water tariffs since 2017, it has not been able to do so because the MEAH has not authorized it.*1 ->In particular, if the regulatory body, SOREA, functions properly, this could lead to a revision of water tariffs. In addition to the small amount allocated to the sector over the past decade, the MEAH's budgetary credibility is limited. Budget credibility measures the extent to which budget forecasts are respected during the project implementation phase. Project execution remains low, averaging 53% over the 2015-2020 period for MEAH. This weakness may reflect budget reshuffles on the part of the Ministry of Economy and Finance (MEF) during the fiscal year, but also, and above all, low absorption capacities on the part of MEAH. This pace project execution is a risk identified in the master plan, since the investment planning tool we have developed is likely to become obsolete very quickly. To remedy this shortcoming and maintain a good level of investment consistency and predictability, the MEAH should consider revising the planning of SAEP (Drinking water supply system) improvement works at least every three years.*12
		The utility does not have the power to make personnel decisions	☒	☐	
	7	Development Partner (DP) Support			
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☐	☐	WB's project insisted that it would contribute to "Enhance resilience of livelihoods of vulnerable households in rural and urban areas," focusing in particular on poor households living in urban or peri-urban areas, through improving their access to water. However, the effects of the project are unknown.*2

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		There is no continued donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☒	☐	On-going project/grant 'EIB: €35 million loan of JIRAMA Water III to the Republic of Madagascar for the project involving making priority investments for the drinking water supply system of the Urban Municipality of Antananarivo, implemented by JIRAMA. The project identifies obsolete pipes with repetitive leaks to be replaced (obsolete pipes identified 70km). JICA: Grant Agreement with Madagascar : Contributing to safe and stable water supply through constructing, installing, and replacing water supply facilities in Toamasina (Maximum Grant Amount: 2,896 million Japanese Yen, Implementation period: 47 Months) World Bank: Madagascar National Water Project combines infrastructure investments and institutional development to address challenges related to water resources and services, while also addressing the resilient recovery needs emerging from the impact of cyclones. The total project cost is \$220 million, and it was approved on June 17, 2022. The proposed project aims to address the production gap in Antananarivo; improve the performance of water services in the capital and select cities; develop strategic studies to plan future engagements; and strengthen the capacity of JIRAMA and the MEAH as key sector institutions to help deliver and oversee inclusive, affordable, sustainable, and resilient services. The Hydraulic Master Plan is being prepared in under development through the World Bank PRODUIR project. (*2, 9) The HMP aims to update the 2003 Master Plan, with a time horizon to 2050, and includes an assessment of surface and groundwater availability around Antananarivo. JIRAMA wishes to receive the following support for infrastructure from the Development Partner. - Construction of new water treatment plants and tanks - Replacement of old pipes and old meters - Expansion of connection - Total renovation of the existing treatment plant (Mandroseza) *4 The Master Plan for Antananarivo is progressing, but the key issue is the groundwater study. However, this study is expected to be completed by January 2025, with the final report scheduled for presentation in July 2025. Based on this report, the World Bank will decide which project or infrastructure to finance. The planned investment
		No continued donor support for capacity development projects	☒	☐	Ongoing assistants from DPs*4 (1) Infrastructure projects: - Construction of new water treatment plants and tanks - Replacement of old pipes and old meters - Expansion of connection (2) Capacity development project/training: - Training of technicians in preparation - Acquisition of tools in preparation - Acquisition smart meter - pilot project JIRAMA wishes to receive the following support for Capacity development from the Development Partner. - Tank Trucks - Replacement of all mechanic meters to smart meter - Cars and trucks for operations, tanks trucks - Computers and materials for digitalization - Tools and machines for work - Training for water technicians - Teleoperation *4
	8	Socioeconomy			
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate fluctuations, etc.)	☐	☒	Inflation rate is high at 8.16% in 2022 and 9.86% in 2023.*6 The central bank raised its policy rates in August 2024 in response to persistent inflationary pressures.
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☐	☒	Access to infrastructure in Madagascar, including electricity and digital, is among the lowest in Sub-Saharan Africa and in the world. An estimated 33.7% of the population has access to electricity, compared to an average of 48.4% for Sub-Saharan Africa in 2020. Over 18 million people currently lack electricity access, placing Madagascar 13th in the list of countries with the largest unelectrified population worldwide. *6 Despite a notable expansion of its power generation capacity during 2023, Madagascar has been marked by persistent power cuts, revealing structural and operational challenges in the country's energy sector. Power cuts persist due to structural problems such as dilapidation, saturation of Jirama's distribution network and vulnerability to bad weather.*8(News) Jirama is implementing 3-4-hour power interruptions nationwide in early May. The utility has reportedly explained that it could not continuously run its generators due to a fuel shortage. Power cuts typically occur during peak demand periods in the day, with continuous power restored at night. Reports suggest that power cuts typically last longer than the scheduled periods. JIRAMA Facebook page shows further details on the electricity schedule and affected locations*9(News) The high poverty rate (80.7% in 2023, \$2.15 per person per day) makes it difficult to raise tariff of water and electricity(*10)
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☐	☐	

Note: Blue color indicates recommendation or plan in the existing documents and red color indicate major issues identified by JICA Study Team through this analysis.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Source			
※	1	環境JR24039 調査報告書 01			
	2	2022 World Bank Madagascar-National-Water-Project			
	3	JICA_トアマシナ市上下水道システム拡張及び改善計画_調査報告書公開 01 (same as 1)			
	4	JIRAMA's responses to this project's questionnaire recorded on 8 Nov 2024			
	5	decret_2003_791_tarifaire			
	6	RAPPORT D'ACTIVITES JIRAMA 2023			
	7	https://www.worldbank.org/en/news/press-release/2023/04/07/madagascar-afe-set-to-expand-access-to-renewable-energy-and-digital-services-thanks-to-400-million-credit#:~:text=An%20estimated%2033.7%25%20of%20the,the%20largest%20unelectrified%20population%20worldwide.			
	8	https://midi-madagasikara.mg/electricite-des-coupures-persistantes-malgre-une-importante-hausse-de-la-production/			
	9	https://documents1.worldbank.org/curated/en/278971526787017252/pdf/MADAGASCAR-PAD-04302018.pdf			
	10	https://www.worldbank.org/en/cou ntry/madagascar/overview			
	11	Données RH (from JIRAMA)			
	12	MASTER PLAN DEVELOPMENT DRINKING WATER SUPPLY FOR THE GREATER ANTANANARIVO AREA			
	13	Mission report 1: Presentation and analysis of the initial situation (July 2023)			
	14	JIRAMA Budgeted fraiming 2025			
	15	Meeting with the CEO of JIRAMA on 27 Jan. 2025			
	16	Meeting with the Chief Financial Officer (CFO) on 28 Jan. 2025			
	17	Meeting with the Planning and the Water Project Coordinator on 27 Jan. 2025			
	18	Meeting with the World Bank on 28 Jan. 2025			

0. Benchmark

Major Categories	Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
					1	2	3	4
Water service	Service level	1. Service improvement and more investment	1	Investment cost (Currency)	—	—	—	—
			2	Production capacity (m ³ /day)	—	—	—	—
			3	Production (m ³ /day)	—	—	—	—
			4	Utilization ratio of production capacity (%)	—	—	—	—
			5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
			6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
			7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
			8	Leakage ratio (%)	—	—	—	—
	Business scale	2. Increased customer base and satisfaction	9	Population served	—	—	—	—
			10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
			11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
			12	Water sold (m ³ /day)	—	—	—	—
			13	Water consumption per capita per day (L/c.a./day)	—	—	—	—
	Cost-effectiveness	3. Increased tariff revenue	14	Turnover	—	—	—	—
			15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
			16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%	15%
			17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
			18	Water tariff level	—	—	Aim for a level of sustainable investment	—
	Prerequisites	4. Improved financial management	19	Accounting system	—	—	Aim for Public Company Accounting	—
			20	Net income (Currency)	—	—	—	—
	21		EBITDA (Currency)	—	—	—	—	
	22		EBITDA margin (%)	Negative	20%-40%	Aim for 40% or more	—	
	23		EBITDA margin excluding deferred income (%)	Negative	20%-40%	Aim for 40% or more	—	
	24		Total capital operating margin (%)	—	—	—	—	
	25		Operating Profit Margin(%)	—	8% or less	Aim for 10% or more	—	
	26		Equity ratio (%)	—	30% or less	Aim for 40% or more	—	
	27		Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—	
	28		O&M cost coverage ratio (%)	—	Less than 100	101-130	—	
	29		O&M cost coverage ratio excluding subsidies (%)	—	Less than 100	101-130	-	
	30		Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	—	—	—	—	
	31		Supply price (Currency/m ³) (Turnover from sales/ Water sold)	—	—	—	—	
			Overall cost excluding depreciation expense	—	—	—	—	
			Overall cost including depreciation expense	—	—	—	—	
	32		Subsidies (Currency)	—	—	—	—	
	33		Development Partner grant support (Currency)	—	—	—	—	
	34		The ratio of subsidies and DP support to turnover	—	—	—	—	
	Human resource efficiency			35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnostic and Solutions Report -

National Water and Sewerage Corporation (NWSC)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

S. Overall Summary

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
- 3a. Bottleneck analysis (details)
0. Benchmarks
- 7.1. PL-NRW1 (NRW reduction benefit- Case 1)
- 7.2. PL-NRW2 (NRW reduction benefit- Case 2)

S. Overall Summary of Diagnostics and Potential Solution

Utility name : NWSC

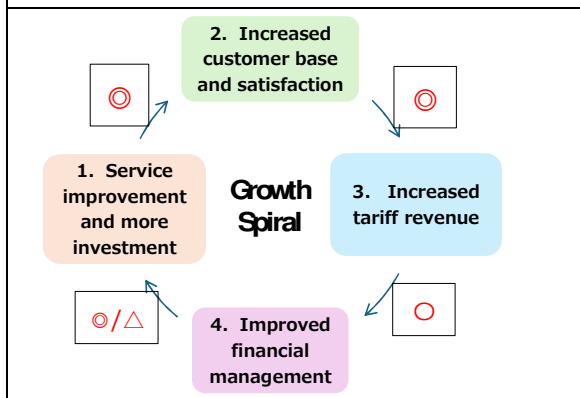
Summary of Growth Spiral diagnostics*1

Improvements in water production capacity and increased production volumes have enhanced service delivery, including improved service continuity, resulting in a higher population served and increased sales. Nonetheless the service coverage ratio has not increase but remained constant, but this is due to a rapid increase in population in the GKMA. There remains a 36% surplus in water production capacity, and both production and sales volumes are expected to grow in the coming years. To achieve this, it is anticipated that expanding last-mile connections through the development of water distribution pipelines and related infrastructure will be essential.

- In terms of costs, while sales increased by 14% compared to the previous fiscal year (2022/2023), O&M costs rose at the same rate, highlighting the need for more efficient operations. Additionally, the O&M cost coverage ratio, excluding subsidies and grants (deferred income), stands at only 112%. This insufficient O&M coverage ratio is partially attributed to the high NRW rate, particularly in Kampala, where it exceeds 40% and water tariff, which does not need to cover investment capital expenditure.

- Due to the insufficient O&M cost coverage ratio excluding deferred income, it is currently challenging for NWSC to finance major capital investments in future. As a result, while assuming continued support from the government and development partners for facility development, it is desirable for NWSC to gradually strengthen its financial capacity to enable major investments using internal funds and borrowings by itself in the future.

- Overall, the growth spiral is working, particularly in spirals 1 to 3. The primary limiting factor is the high NRW, especially in Kampala. The spiral 4 to 1 is currently supported by subsidies and grants. Ideally, in the future, this cycle should primarily be driven by self-generated funds.



*1: Refer to "4.GS diag"

Legend

- ⊙ Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "3.Summary of bottleneck analysis"

Internal factors:

1) Outpaced development of water distribution infrastructure

Despite increased water production capacity from the 2021 Katosi Water Treatment Plant, bulk transmission, storage, and distribution infrastructure remain inadequate, keeping service coverage stagnant.

2) High NRW ratio

NRW reached 35.4% in 2021/22, with Kampala's NRW at 40.4% as of March 2024. High commercial (21%) and physical losses (16.4%) negatively impact financial performance by increasing costs and reducing revenue.

3) High operational costs

The O&M cost coverage ratio (112%) is insufficient for self-financing. High NRW, electricity, and staff costs drive up operational expenses, while tariffs remain relatively high compared to other utilities in this study.

4) Limited advanced distribution management

Aged distribution networks and limited advanced management hinder service reliability in parts of GKMA.

5) Future challenge of investment

Limited self-funding capacity prevents NWSC from covering major investments, reliance on government and DPs for financial support.

External factor:

6) Rapid urbanization and population growth

The GKMA population has grown from 2.4 million (2014) to over 4 million today, leading to increasing water demand that outpaces infrastructure capacity and service area expansion.

7) Government policy for infrastructure provision by the government

Infrastructure provision is a government responsibility, with funding mainly from subsidies, grants, and deferred income. This reliance raises concerns about long-term financial sustainability.

Recommendations for Improvement

Refer to "5.Strategy analysis"

Mid-Term Goal: "Internal funding and fundraising capacity is strengthened by enhancing operational efficiency including reducing NRW, optimizing costs, and appropriately adjusting water tariff rates to achieve commercially and financially sustainable management in the mid-term"

- The current water tariff level is insufficient to cover all operating and investment costs.

It is recommended that:

- Large-scale facility expansions and rehabilitation projects may continue to depend on external funding, such as subsidies, F10grants and concessional loans from development partners (DPs).

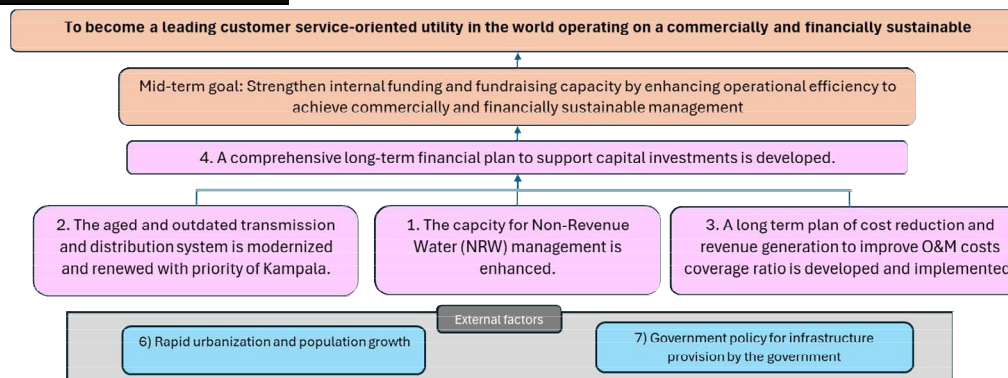
- Smaller-scale investments, such as the rapid implementation of water connections to expand service coverage, should be financed through internal funds.

- The NRW ratio in Kampala is the highest among all regions and must be addressed to improve NWSC's financial sustainability. The improvement measures implemented in Kampala will serve as a model for other regions.

- In parallel, efforts to reduce NRW, optimize costs, expand the served population, and review and adjust tariffs should be pursued to strengthen internal funding capacity and enhance fundraising potential.

Scenario of Improvement

Refer to "6.Solution"



1. Diagnostics based on indicators (Index diag)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

Unit: Thousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Calculation	Utility name: NWSC				Improvement trend	Stage of growth				Remarks (Additional information)	Initial diagnosis by indicator
					KPI Values										
					19/20	20/21	21/22	22/23		19/20	20/21	21/22	22/23		
Service level	Service Improvement and Investment Activities	1	Investment cost (Currency)	Payments to acquire tangible assets		129,161,997	834,800,704	21,031,911	→	-	-	-	-		
		2	Production capacity (m³/day)		465,091.0	554,394.0	702,563.0	756,325	↗					Construction of the Katosi WTP (160,000 m3/day) in 2021	Water purification production capacity is increasing rapidly.
		3	Production (m³/day)		382,865	394,809	451,679	468,659	↗	-	-	-	-	346,000 in 2017/18	The amount of water produced is also increasing rapidly.
		4	Utilization ratio of production capacity (%)		82.32	71.21	64.29	61.97	-	-	-	-	-		
		5	Continuity of Service (Hrs/day)		18	20	20		↗	2	2	2	NA		Although the water supply is not continuous, it provides water for 20 hours and poses few issues.
		6	Quality of water supplied (Compliance rate: %)			98.0	98.0	98.5	→	NA	4	4	4	Compliance	The quality of the water supply is also in almost 100% compliance with the standards.
		7	Water supply pressure				The further you move away from Kampala City, the lower the water supply pressure becomes.			-	-	-	-	Water supply pressure ranges from 7 to 30 psi, with an average of about 14 psi.	Water pressure is unstable in Kampala. Other areas are unknown.
		8	Leakage ratio (%)				18.4			-	-	-	-		Approximately half of non-revenue water is leakage (Document A)
Business scale	Customer Increase and Trust	9	Population served / connections		724,006	775,794	857,347	892,099	↗	-	-	-	-	Connections. Number of connections: 582,863 in 2017/18	It has increased significantly.
		10	Service coverage / Water coverage (%)	Served population / Population in the service area	84.0	84.0	84.0	84.0	→	3	3	3	3	83.7% in 2017/18	The penetration rate is stable and high.
		11	Customer satisfaction (%)			87	75	86	→	NA	3	2	3	Customer Satisfaction Index	High customer satisfaction
		12	Water sold (m³/day)		239,726	245,966	279,274	288,096	↗	-	-	-	-		
Cost-effectiveness	Water Tariff Profitability Improvement	13	Water consumption per capita per day (L/c.a/day) (sold water/service population)	Water sold / Served population	331.1	317.1	325.7	322.9	→	-	-	-	-	Per connection	
		14	Turnover from sales	Revenue from water service	370,705,256	461,000,000	519,000,000	550,000,000	↗	-	-	-	-		
		15	Collection ratio (%)	collected/ billed for the year	92	101	96	91	↘	3	4	3	3		High
		16	Non-revenue water ratio(%)		35.4	34.5	35.4	34.9	→	2	2	2	2	In Kampala district, it was 41.3% (31% in 2017/18, 29% in 2018/29)	Non-revenue water rate is high, which has increased significantly since 2017/19
Prerequisites		17	Metering ratio (%)		99.99	100	100		→	4	4	4	NA		
		18	Water tariff level (6m3/USD)			-	-	6.84	-	-	-	-	-		
Profitability	Management and Financial Improvement	19	Accounting system		Accrual accounting	Accrual accounting	Accrual accounting	Accrual accounting	→	3	3	3	3		
		20	Net income (Currency)		506,297	47,789,165	-38,866,146	40,787,210	↗	-	-	-	-		The main cause of the decrease in FY2021/2022 is the increase of depreciation cost due to increase of the plant, property, and equipment
		21	EBITDA (Currency)	Gain/Loss before tax + Finance cost + Depreciation + Amortization	103,323,677	106,439,432	122,743,958	131,007,796	↗	-	-	-	-		It increased steadily
		22	EBITDA margin (%)	EBITDA / Income (Sales)	22.0	28.0	29.0	28.0	→	2	2	2	2		It has been stable
		23	EBITDA margin excluding deferred income (%)	(EBITDA - Deferred income) / Income (Sales)	5.0	8.0	7.0	11.0	↗	2	2	2	2		The deferred income have been large
		24	Total capital operating margin (%)	Operating profit incl. deferred income / Total asset	3.0	2.8	3.0	3.0	→	-	-	-	-		It has been steadily low
		25	Operating Profit Margin(%)	Operating profit incl. deferred income / Total income	4.1	3.0	-2.1	3.8	↗	2	2	1	2		It recorded negative in the recent year
		26	Equity ratio (%)	Equity / Total asset	37.2	35.5	34.1	33.1	↘	2	2	2	2		It decreased
Financial soundness		27	Fixed long term conformity rate (%)	Fixed asset / Fixed liability	98.0	97.0	93.8	90.9	↘	3	3	3	3		Healthy
		28	O&M cost coverage ratio including subsidies/ grants and excluding depreciation (%)	(Operating income) / Operating cost (incl. administration cost, excl. dep)	125	130	131	131	↗	2	3	3	3		It increased steadily
		29	O&M cost coverage ratio excluding subsidies/grants and depreciation (%)	(Operating income excl.deferred income) / Operating cost (incl. administration cost, excl. dep)	105	109	108	112	↗	2	2	2	2		Not enough to cover investment cost
		30	Unit cost of water supply (Currency/m³) (Overall cost including depreciation/Water sold)	Overall cost including DEP/Water volume sold	5,056	4,925	5,107	4,924	↗	-	-	-	-		The unit cost of water supply is larger than the supply price.
		31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	Turnover from sales/ Water volume sold	4,237	5,135	5,091	5,230	→	-	-	-	-		See above
			Overall cost excluding depreciation expense	Operating cost excl. dep.	359,844,559	354,377,299	396,538,489	419,030,972	↘	-	-	-	-		-
			Overall cost including depreciation expense	Operating cost incl. dep.	442,438,000	442,141,192	520,610,502	517,735,357	↘	-	-	-	-		-
		32	Subsidies (Currency)	Deferred governmental subsidies in P/L	58,000,000	48,471,536	42,657,245	24,392,550	↘	-	-	-	-		It decreased steadily
HR efficiency		33	Development Partner grant support (Currency)	Deferred DP's grant in P/L	25,805,283	26,825,712	48,914,452	55,369,006	↗	-	-	-	-		It increased due to construction completion
		34	The ratio of subsidies and DP support to turnover	Deferred subsidies + grant / total income	22.6	20.0	21.6	10.1	→	-	-	-	-		It has been steady
		35	Number of staff per 1,000 connections		6	6	5	5	→	3	3	3	3		Decreased
			Inflation		2020	2021	2022	2023		https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=SS				3 year average	4.9
					25/12/2020	31/12/2021	30/12/2022	30/12/2023		UGX/USD 0.00027 (▲0.22%) Google Finance					
			Exchange rate		0.00027	0.00028	0.00027	0.00026							
			Difference			4%	-4%	-4%							

2. Analysis based on financial statements (FS analysis)

Summary

-The operating cost coverage ratio is 130%, which is almost stable from FY2019/2020. The operating cost coverage ratio excluding subsidies has improved from only 105% in FY2020/2021 to 112% FY 2023/2024. This low operating cost coverage ratio excluding subsidies indicates that as an entity alone, NWSC is not in a position to make capital investments/replacement by its internal sources. Thus, its capital expenditures are funded by development partners and subsidies.

- Compared to the previous year, the revenues increased by 14%. The expenses (excluding depreciation) increased by 15% due to increase of employee benefit expenses and administrative cost.

- The depreciation in the FY 2023/2024 increased only by 2% because of the lack of large investments completion.

- While EBITDA recorded steady growth for last 4 years, EBITDA margin has been around 23% to 28% for same period.

- Regarding the operating expenses, the personnel costs comprise 44%, which is a very high proportion. The electricity accounts for 17% of the operating cost.

- Given that the sewage system development will also proceed in the future, it is becoming necessary to take into consideration the revenues and expenses in the sewage business.

Positive

1. The EBITDA has been increasing steadily.
2. The capital expenditures are higher than EBITDA, indicating a high level of capital investment.
3. The company's financial health is stable, with an equity ratio of more than 30%.

Negative

1. The operating cost coverage ratio excluding subsidies is low at 112%. This needs to be improved.
2. The subsidies account more than 50% of the balance sheet, indicating a high dependence on subsidies.
3. The number of days for accounts receivable turnover was less than 200 days, 163 days in FY2020/2021 and 163 days in FY2021/2022, but it deteriorated significantly to 313 days in FY2022/2023. It improved to 278 days in FY2023/2024, but remains at a high level. This shows that the collection of water charges has not progressed in line with the expansion of services.

Analysis

No.	Category	Analysis
1	Basic information	
	Accounting standards	•Accrual accounting has already been introduced and depreciation and amortization had been implemented.
	Comments by auditor	•The auditor noted on the expected credit losses on trade receivables. •The auditor noted on the land matters.
2	P/L	
	Profitability	- The Water and sewage revenues are approximately USD 143 Million. - Compared to the previous year, the revenues increased by 14%. The expenses (excluding depreciation) increased by 15% due to increase of employee benefit expenses and administrative cost. - The main cause of the decrease in FY2021/2022 is the increase of depreciation cost due to increase of the plant, property, and equipment. The depreciation in the FY 2023/2024 increased only by 2% because of the lack of large investments completion. - The increase in revenues was mainly due to water and sewage revenues. - The operating cost coverage ratio is 130%, which is almost stable from FY2019/2020. The operating cost coverage ratio excluding subsidies has improved from only 105% in FY2020/2021 to 112% FY 2023/2024.
	Revenues Composition	•Out of the water and sewage revenues, which account for 82% of total revenues, sewage revenues only account for approximately 13%. However, the percentage may increase as the sewage system continues to be developed. (The sewage rates are set at 75% of the water supply rate for general household.) •13% of revenues come from the amortization of deferred revenue, which is government and development partners' funds for capital investment, and is highly significant. •The customer mix of water revenue consists of domestic customers at 45%, followed by commercial, government, and other customers, while industrial customers are only low at 4%.
	Subsidy details and trends	•The amortization of deferred revenue, which is a subsidy, can be divided into two categories: one is a amortization of the construction cost of the completed project over its useful lifetime, and the other is a government subsidy that is treated as a revenue grant, which accounts for 47% of the total subsidy. The government grants consist of SCAP100 (100% Service Coverage Acceleration Project), etc. •The revenue grants received in the current year are recorded as deferred income in P/L. The SCAP100 is for construction of public stand posts and other improvements in villages, and SCAP100 is scheduled to end in June 2023.
	Expenses Composition	• The personnel costs account for 42% of the total expenses , excluding depreciation and amortization. •However, it is not possible to identify the costs separately for water and wastewater.
3	B/S	
	Financing	•The equity ratio is at 32.5%, which is not low. Deferred income comprises more than 50% of total assets. Thus, the capital structure is supported by subsidies. In addition to that, the almost all deferred incomes are funded by development partners. •In particular, long-term capital investment funds almost come from development partners (KfW, AFD, World Bank, DANIDA, etc.). Short-term has been by the Ugandan government. •Regarding the borrowing, NWSC borrowed UGX50billion in FY2019/20 and UGX95billion in FY2021/22 with the approval of the Ugandan government. The latter borrowing is scheduled to be fully repaid in 2027 and is for a period of 5 years. While this borrowing is still small as 1% of total assets in FY21/22, it is significant considering that the subsidy from the Ugandan government was only UGX37 billion in FY2021/22
	Fixed Assets	•Pipe works accounted for 57% of Property, plant and Equipment, and Civil structure accounted for 19%. In FY2021 and FY2022, capital works-in-progress are decreasing, and no major projects are expected to be completed in the following year. •NWSC revalued all its assets in 2008, and in January 2018.
	Accounts Receivable	•Accounts receivable are up by 26% from the previous year. The rate of increase is greater than the rate of increase in sales, indicating that the collections of water bill is deteriorating. Accounts receivable amounted to 182 days of sales. Against this, a reserve has been made of 0.04% of accounts receivable, which may be an underestimate. 20% of the account receivables are receivables to ministries, departments and agencies of governments, which remain outstanding for more than one year. Although this amounts have reduced from the previous year, the settlement of this amount is a concern.
4	C/F	
	Trends	•The cash flow from operating activities decreased by 61% in 2021/2022 from the previous year due to an increase in accounts receivable. •Cash outflows from capital expenditures of UGX193billion were offset by grants of UGX 283billion, resulting in an increase in the cash and cash equivalents balance.

JICA Exchange rate in Nov 2024

1UGX= 0.0440 Yen

1USD= 157.655 Yen

1UGX= 0.000279 USD (Calculated using the rate above)

GDP per capita (US\$)

1,014.20

Year 2023, WB

median monthly household income by selected background characteristics, (p93), The Uganda National Household Survey 2019/2020

436,000 UGX/month in Urban

151,000 UGX/month in Rural

190,000 UGX/month

121.6 USD/month in Urban

42.1 USD/month in Rural

53.0 USD/month

3. Summary of bottleneck analysis

Summary of bottleneck analysis

Bottleneck analysis
Internal factors: 1) Outpaced development of distribution infrastructure according to rapid population growth and urbanization The commissioning of a new water treatment plant at Katosi in 2021 has helped mitigate the growing water demand in the Greater Kampala Metropolitan Area (GKMA). However, the region continues to face challenges related to bulk transmission, storage, and distribution infrastructure, which are necessary to fully leverage the increased water production capacity. As a result, despite a 36% surplus in water production, service coverage has remained stagnant. 2) High NRW ratio In 2021/22, the leakage ratio (physical losses) and commercial losses were 18.4% and 17.0%, respectively, accounting for a total NRW of 35.4%. In Kampala, which accounts for 45% of NWSC's total connections, the NRW ratio stood at 40.4% as of March 2024, exceeding the NWSC average. The breakdown of NRW includes unbilled authorized consumption (8%), commercial losses (21%)—comprising unauthorized or illegal consumption (10.5%) and metering inaccuracies (10.5%)—and physical losses (16.4%). The high levels of both commercial and physical losses have a significant negative impact on financial capacity, increasing costs while reducing revenue. 3) High operational costs The O&M cost coverage ratio, excluding subsidies, grants, and depreciation, stands at 112%, which remains insufficient for strengthening self-funding capacity. High NRW, electricity costs, and staff expenses contribute to the overall high operational costs. Water tariffs are indexed to inflation and other factors. Compared internationally, NWSC's tariff levels are relatively high coming with other utilities in this study. 4) Limited advanced distribution management The limited advanced distribution management in addition to aged distribution networks in Kampala hinder service reliability in the part of the GKMA area. 5) Future challenge of investment Based on the above, the insufficient self-funding capacity prevents NWSC from covering major investment costs, posing a future challenge. The difficulty in self-financing future investments results in continued reliance on Development Partners (DPs) for financial support. External factor: 6) Rapid urbanization and population growth The GKMA (Greater Kampala Metropolitan Area) has witnessed rapid urbanization and population growth, rising from a population of 2.4 million in 2014 to a population of more than 4 million today. Increasing water demand outpaces infrastructure capacity and expansion of service areas, leading to service gaps. 7) Government policy for infrastructure provision by the government Government policy indicates that infrastructure provision is the responsibility of the government. Government subsidies, as well as grants and loans from development partners, are recorded as deferred income from the government and are not reflected in water tariffs. The heavy reliance on deferred income for infrastructure investment raises concerns about long-term financial sustainability.

List of bottleneck analysis results and recommendations for improvement

No	Issues	Diagnostics	Recommendations for improvement	Countermeasure period*2
Internal Factors				
1. Management and finance				
	Issues with accounting consistency and transparency			
	Low profitability	Excluding subsidies, the O&M cost coverage ratio is 108% and the unit cost of water supply is larger than the supply price, which indicate making sustainable investment difficult. Electricity charges are high and labor costs account for 42% of costs. The supply cost is 90 cents/m ³ . It is not cheap. The construction of water purification plants, sewage treatment plants, etc. is carried out with support (subsidies) from donors. Investment in public taps is carried out with government subsidies. It has been made clear that large-scale capital investments are implemented with subsidies/grants mainly from DP funds. A financial structure that relies on subsidies and DP support for all facility development investments is not sound for the future. It is unclear how much investment capital is being allocated to non-revenue water countermeasures to achieve the target. It is assumed that the budget for NRW countermeasures is small.	In the future, it is recommended that revenue levels be improved in stages by improving NRW rates and setting appropriate tariffs, including reducing maintenance costs, so that investment costs can be generated. Regarding investment, it is desirable to first create a structure in which small-scale investments that will lead to short-term revenue increases, such as last-mile connections, can be implemented using the utility's own funds. Regarding investment in measures to NRW, as shown in 2. Service provision and maintenance, it is necessary to update the water distribution network, and it is recommended that investment funds be obtained after the necessary plans are drawn up.	Short-term to long-term
	Challenges in the process of setting tariff			
	Lack of investment capital			
2. Service provision and maintenance				
	The water supply coverage ratio and the population served are not growing.	The GKMA (Greater Kampala Metropolitan Area) has witnessed rapid urbanization and population growth, rising from a population of 2.4 million in 2014 to a population of more than 4 million today. The recent commissioning of a new water treatment plant at Katosi has helped alleviate this increasing demand. However, the region still faces constraints in terms of bulk transmission, storage and distribution infrastructure required to fully benefit from the increased water production capacity.*15	Prepare a water distribution network renewal plan (especially for Kampala) and a long-term investment plan. Kampala, in particular, has a high NRW rate of 41%, and this should be a priority. In conjunction with facility renewal, establish a SCADA/DMA for water distribution management, modernize water distribution management, and prepare a monitoring and control plan for water distribution and NRW. Capacity building for NRW measures, including water meter management, illegal connection measures, and leak detection technology, will be necessary. In its five-year plan starting in 2021, NWSC aims to reduce NRW from 37% to 33%, but progress needs to be confirmed. Meanwhile, planned, organized, and continuous efforts are needed to further reduce the NRW ratio. For this reason, it is recommended that the creation of a NRW management plan, including a planned leak detection system.	short term
	Insufficient infrastructure development	In Kampala, the NRW ratio is 40.4% in March 2024: Commercial losses: 21% (Unauthorized: 10.5%, metering inaccuracies: 10.5%) and Physical losses: 16.4%*15		
	High non-revenue water (NRW) rate	There is a high demand for updating the water distribution network. Many of the distribution pipes in Kampala are over 50 years old. It is assumed that a huge amount of money will be required for updating. The amount and pressure of water distribution are not managed by the DMA. Due to the difference in elevation, it appears that there is an increase in leakage due to high water pressure in low-altitude areas, and water outages due to low water pressure in high-altitude areas. Illegal connections account for about half of the NRW, and there also seem to be many meters with low accuracy. In Kampala, there seems to be more cases of meters not reading in areas with water outages than in other areas. There are illegal connection countermeasure units, but it is necessary to confirm whether they are sufficient for the NRW management. It is assumed that the NRW plan is insufficient. In all areas, active NRW countermeasures such as nighttime minimum flow surveys and leakage detection are not being implemented.		
	High leakage rate			
	Insufficient maintenance of facilities			
	Water outage and unstable supply	NWSC_KW(Kampala Water) NRW Management Strategy July 2021 was		
	No DX utilization and low operational efficiency			

No	Issues	Diagnostics	Recommendations for improvement	Countermeasure period*2
3.	Commercial Operations			
	Low customer satisfaction			
	Low collection rate	Although the collection rate is high, accounts receivable are six months from sales, so collection is taking time. Main delayed payment customers are government agencies.		
4.	Organization and Human Resource Management			
	Shortage of engineers and skills gap	In addition to a NRW management organization, it is necessary to check whether there is a shortage of technical training and engineers. The three-year corporate plan (2021-2024) was to reduce the NRW rate from 37% to 33%. It is necessary to check whether the improvement plan is sufficient, what progress has been made, and what the plans are for 2025 and beyond. Check whether a business plan and facility development plan have been formulated.	A technical training plan for NRW management will be prepared and engineers will be trained. It is necessary to formulate a long-term business plan and facility development plan that includes measures against the NRW.	Short
	Reducing organizational efficiency			
	Lack of strategic management capabilities in the organization			
	Lack of planning			
	Governance issues			
	External factors			
5.	Environment (Water Sources)			
	Depletion of water sources and deterioration of water quality			
6.	Government systems and politics			
	Hindering self-sustaining operations	NWSC is one of "Extra budgetary units" which are not allowed to raise funds through issuance of loans or guarantees without an authorization from the Minister of Finance. NWSC is a national organization and is in line with national policies. Until 2020, the government advocates a nationwide universal water supply service through policy. Although it has an independent accounting system, the performance contract clearly states that facility investment and support for the poor will be carried out with subsidies from the government and DPs. It is necessary to confirm that the contents of this contract will continue in the future. Alternatively, it is necessary to confirm whether self-reliance will be promoted in the future, including investment funds. The government places emphasis on affordability of the water tariff.	It is considered necessary to review long-term tariff setting that comprehensively takes into account long-term investment costs, improvements in operational efficiency (NRW ratio), subsidies, and DP support amounts.	Short
	Challenges in Water Supply Policy			
7.	Development Partner Support			
	Lack of development partner support	In Victoria Lake WATSAN Project, Greater Kampala Network Restructuring and Rehabilitation project will start. In addition AFD will start technical cooperation to address NRW issues, focusing on Kampala. The project is scheduled to commence in January 2025. The strategy will be developed, including SCADA implementation, and equipment will be provided.	It is considered necessary to obtain funds and technical assistance to improve operational efficiency, including measures to combat NRW.	Long
8.	Socioeconomic Finance			
	Socioeconomic Impact	The benchmark interest rate set by the Central Bank of Uganda is high, at 9.75% as of October 2024. If commercial finance is to be utilized, won't the		
	Lack of financial resources			

4. Diagnostics based on Growth Spiral (GS diag)

Overall diagnostics of growth spiral

- Improvements in water production capacity and increased production volumes have enhanced service delivery, including improved service continuity, resulting in a higher population served and increased sales. Nonetheless the service coverage ratio has not increase but remained constant, but this is due to a rapid increase in population in the GKMA. There remains a 36% surplus in water production capacity, and both production and sales volumes are expected to grow in the coming years. To achieve this, it is anticipated that expanding last-mile connections through the development of water distribution pipelines and related infrastructure will be essential.

- In terms of costs, while sales increased by 14% compared to the previous fiscal year (2022/2023), O&M costs rose at the same rate, highlighting the need for more efficient operations. Additionally, the O&M cost coverage ratio, excluding subsidies and grants (deferred income), stands at only 112%. This insufficient O&M coverage ratio is partially attributed to the high NRW rate, particularly in Kampala, where it exceeds 40% and water tariff, which does not need to cover investment capital expenditure.

- Due to the insufficient O&M cost coverage ratio excluding deferred income, it is currently challenging for NWSC to finance major capital investments in future. As a result, while assuming continued support from the government and development partners for facility development, it is desirable for NWSC to gradually strengthen its financial capacity to enable major investments using internal funds and borrowings by itself in the future.

- Overall, the growth spiral is working, particularly in spirals 1 to 3. The primary limiting factor is the high NRW, especially in Kampala. The spiral 4 to 1 is currently supported by subsidies and grants. Ideally, in the future, this cycle should primarily be driven by self-generated funds.

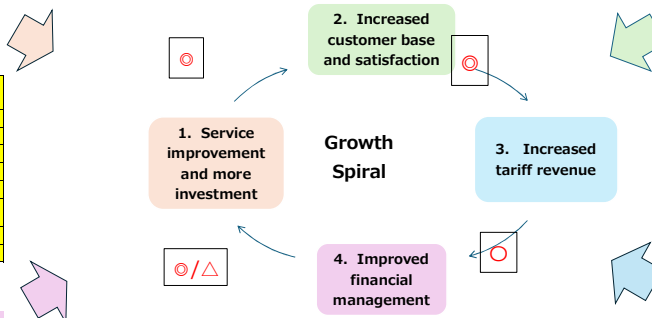
Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?	
Diagnosis result	- Water production capacity has increased in 2021 at Katosi (160,000m3/d) for water supply in Kampala, continuity of service have improved from 18 hours/day (2020/21) to 20 hours/day (2021/22), and water quality continuously complies with the standards. - This has led to an increase in the population served and an increase in the amount of water sold. Nonetheless the service coverage ratio has not increase but remained constant, but this is due to a rapid increase in population in GKMA. - Customer satisfaction has also remained stably high. The spiral from 1 to 2 is working well.

KPI #	KPI	Data (2022/23)	Stage of growth	Trend	Improvement step
9	Population served / connections	892,099	-	↗	
10	Service coverage / Water coverage (%)	84.0	3	→	2
11	Customer satisfaction (%)	86	3	→	
12	Water sold (m/day)	288,096.5	-	↗	
13	Water consumption per capita per day (L/c.a/day) (sold water/service population)	322.9	-	→	

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?	
Diagnosis result	The increase in the population served and the increase in the volume of water sold are leading to increased sales. The spiral from 2 to 3 is working well.
Detailed diagnosis	Causes of high NRW ratio: In Kampala, the NRW ratio is 40.4% in March 2024: - Unbilled authorized: 8% - Commercial losses: 21% (Unauthorised: 10.5%, metering inaccuracies: 10.5%) - Physical losses: 16.4%*15 In other regions (23-28%)

KPI #	KPI	Data (2022/23)	Stage of growth	Trend	Improvement step
1	Investment cost (Currency)	21,031,911	-	→	
2	Production capacity (m/day)	756,325	0	↗	
3	Production (m/day)	468,659	-	↗	
4	Utilization ratio of production capacity (%)	61.97	-	-	1
5	Continuity of Service (Hrs/day)	NA	NA	↗	2
6	Quality of water supplied (Compliance rate: %)	99	4	→	
7	Water supply pressure	NA	-	-	2
8	Leakage ratio (%)	NA	-	-	1



KPI #	KPI	Data (2022/23)	Stage of growth	Trend	Improvement step
14	Turnover from sales	550,000,000	-	↗	
15	Collection ratio (%)	91	3	↘	1
16	Non-revenue water ratio(%)	34.9	2	→	1
17	Metering ratio (%)	100	4	→	
18	Water tariff level (6m3/USD)	6.8	-	-	

Turnover(,000)

Metering ratio is in 2021/22

(4→1) Is the financial improvement leading to investment activities?	
Diagnosis result	- Investment in facility development is mainly implemented with subsidies from the government and grants from development partners (DPs). In particular, long-term investment in facility development is funded by DPs support, while short-term investment is funded by government subsidies. Short-term investment such as the installation of public taps (public stand posts) is also funded with subsidies. - These investments has led to an increase in water production capacity and an increase in continuity of service. - As a policy, NWSC do not need to achieve full-cost recovery including investment cost and water tariff does not include investment costs. The spiral from 4 to 1 is currently working with subsidies and grants. Ideally, in future, this spiral should primarily operate using self-owned funds. Therefore, this spiral is ○/△. - For future, how long are subsidies and grants expected to continue supporting capital investment? - Check outlook for future investment funding sources for facility development.

KPI #	KPI	Data (2022/23)	Stage of growth	Trend	Improvement step
19	Accounting system	Accrual accounting	3	→	
20	Net income (Currency)	40,787,210	-	↗	
21	EBITDA (Currency)	131,007,796	-	↗	3
22	EBITDA margin (%)	28.0	2	→	3
23	EBITDA margin excluding deferred income (%)	11.0	2	↗	3
24	Total capital operating margin (%)	3.0	-	→	
25	Operating Profit Margin(%)	3.8	2	↗	
26	Equity ratio (%)	33.1	2	↘	
27	Fixed long term conformity rate (%)	90.9	3	↘	
28	O&M cost coverage ratio including subsidies/ grants and excluding depreciation (%)	131.3	3	↗	3
29	O&M cost coverage ratio excluding subsidies/grants and depreciation (%)	112.2	2	↗	3
30	Unit cost of water supply (Currency/m³) (Overall cost including depreciation/Water sold)	4,923.5	-	↗	
31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	5,230.4	-	→	
32	Subsidies (Currency)	24,392,550	-	↘	
33	Development Partner grant support (Currency)	55,369,006	-	↗	
34	The ratio of subsidies and DP support to turnover	10	-	→	
35	Number of staff per 1,000 connections	5	3	→	

(3→4) Is the tariff revenue improvement leading to financial improvement?	
Diagnosis result	- The operating cost coverage ratio is 130%, which is almost stable from FY2019/2020. The operating cost coverage ratio excluding subsidies has improved from only 105% in FY2020/2021 to 112% FY 2023/2024. Thus the water revenue is not sufficient to cover investment expenditures. - The high NRW ratio and declining collection ratio are weakening financial capacity. The O&M cost coverage ratio excluding subsidies, grants, and depreciation, is not high. - Almost all financial indicators show an upward trend. The spiral from 3 to 4 is working, but own funding capacity needs to be strengthened through improved revenue collection and reduced NRW. The insufficient O&M cost coverage ratio, excluding subsidies, grants, and depreciation, can be attributed to several factors. On the expense side, high NRW and other significant costs, such as electricity, contribute to increased expenditures. On the revenue side, water tariffs remain insufficient to achieve full cost recovery, including capital expenditures.

USD

1.37

1.46

15 USD/month (assuming 10m3/month/family)
28% of median household income in Uganda (2019/2020)

Legend

- Working well
- Working
- △ Not working well

Note:
The bold KPIs represent the primary decision indicators that determine whether the components of the growth spiral are functioning well.

UGX= 0.000279 USD

5. Strategy analysis

Medium- to long-term direction of the water utility

1. NWSC Vision and Mission:

Vision: The Leading Customer Service-Oriented Utility in the World

Mission: To sustainably and equitably provide cost effective, quality water and sewerage services while conserving the environment and enhancing stakeholder trust

Strategic Theme: Water and Sanitation for all

2. Legal Framework:

In the NWSC Act 1995 (version in 2000), NWSC needs to operate and provide water and sewerage services on a sound commercial practice and maintaining the corporation's financial viability, or on **a commercially and financially sound basis**, in the areas entrusted to it.

3. Corporate Plan 2024-2027

The number of connections is planned to expand from 950,000 in FY2023/2024 to 1,250,000 in FY2028/29, with a 5.6% annual growth rate expected. As a result, turnover (Net VAT) is expected to increase from US\$ 643 billion to US\$ 745 billion. The company also plans to reduce leakage (NRW) ratio from 34% to 30%. The plan is to make investments in facilities to increase the connection rate while also working to improve NRW.

4. NWSC Makes Giant Strides in Service Delivery (Projection in 2029) in homepage

- Operating in 350 towns
- Serving 25,000,000 people, 1,200,000 Connections, Coverage 95%
- 25,063 Km Water Network
- Customer Satisfaction Index – 80%

5. National Water Policy (1999)

Policy Objectives for domestic water supply: Sustainable provision of safe water within easy reach and hygienic sanitation facilities, based on management responsibility and ownership by the users, to 75% of the population in rural areas and 100% of the urban population by the year 2000 with an 80%-90% effective use and functionality of facilities.

6. Eight Performance Contract (PC8) for the period 1st July 2024 – 30th June 2027 between the Government and NWSC

Targets to 2027:

Technical: NRW (Kampala Water:38% and other Regions: 25-28%), System input metering ration: 90%, New water connections: 60,000

Commercial: Water Sales Volume Growth: 125%, Collection/Billing Ratio:95%, Average days receivable: 114 days

Finance: Return on capital employed, Operation cost/revenue (total income); 77%

Quality of service & Environment:

Pro-poor orientation: Pro-poor connection growth: 4500

Transparency and governance:

Customer focus and cares: Customer Satisfaction Index: 78%

Suggestions for direction of improvement

Overall Goal: "To become a leading customer service-oriented utility in the world operating on a commercially and financially sustainable foundation"

NWSC aims to become a leading customer service-oriented utility in the world as stated in its vision by promoting water supply and improving water supply services. As stated in the NWSC Act of 2000, NWSC needs to operate and provide water and sewerage services **on a sound commercial practice and maintaining its financial viability**.

Mid-Term Goal: "Internal funding and fundraising capacity is strengthened by enhancing operational efficiency including reducing NRW, optimizing costs, and appropriately adjusting water tariff rates to achieve commercially and financially sustainable management in the mid-term"

- The current water tariff level is insufficient to cover all operating and investment costs.

- It is recommended that:

- Large-scale facility expansions and rehabilitation projects may continue to depend on external funding, such as subsidies, grants and concessional loans from development partners (DPs).
- Smaller-scale investments, such as the rapid implementation of water connections to expand service coverage, should be financed through internal funds.
- The NRW ratio in Kampala is the highest among all regions and must be addressed to improve NWSC's financial sustainability. The improvement measures implemented in Kampala will serve as a model for other regions.
- In parallel, efforts to reduce NRW, optimize costs, expand the served population, and review and adjust tariffs should be pursued to strengthen internal funding capacity and enhance fundraising potential.

Managed low NRW

1. Implement NRW management strategy and plan

1.1 Improve meter management measures

1.2 Implement illegal connection measures

1.3. Enhance organizational capacity of NRW management

2. Renew aged pipes

2. Introduce advance distribution management

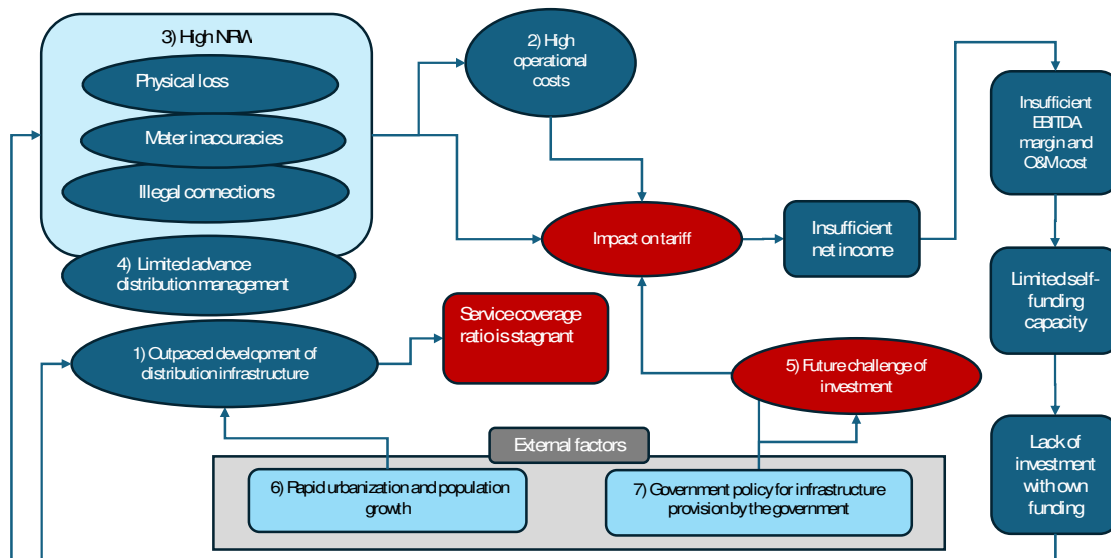
3. Optimize costs

4. Review and adjust tariff

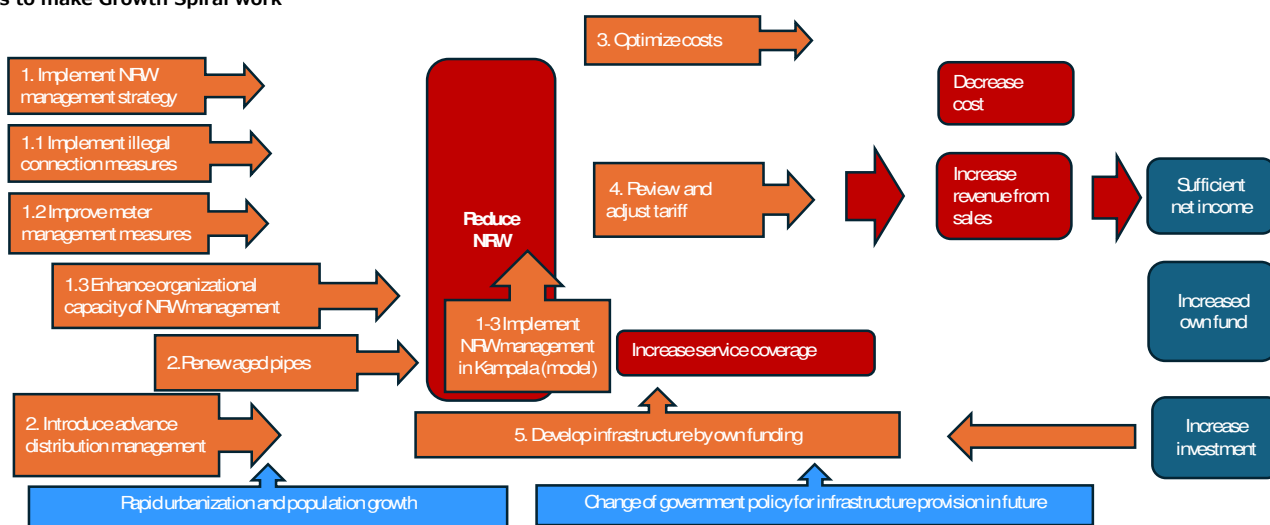
5. Development infrastructure by own funding and initiatives

(External factor: Update of government policy for infrastructure provision in future)

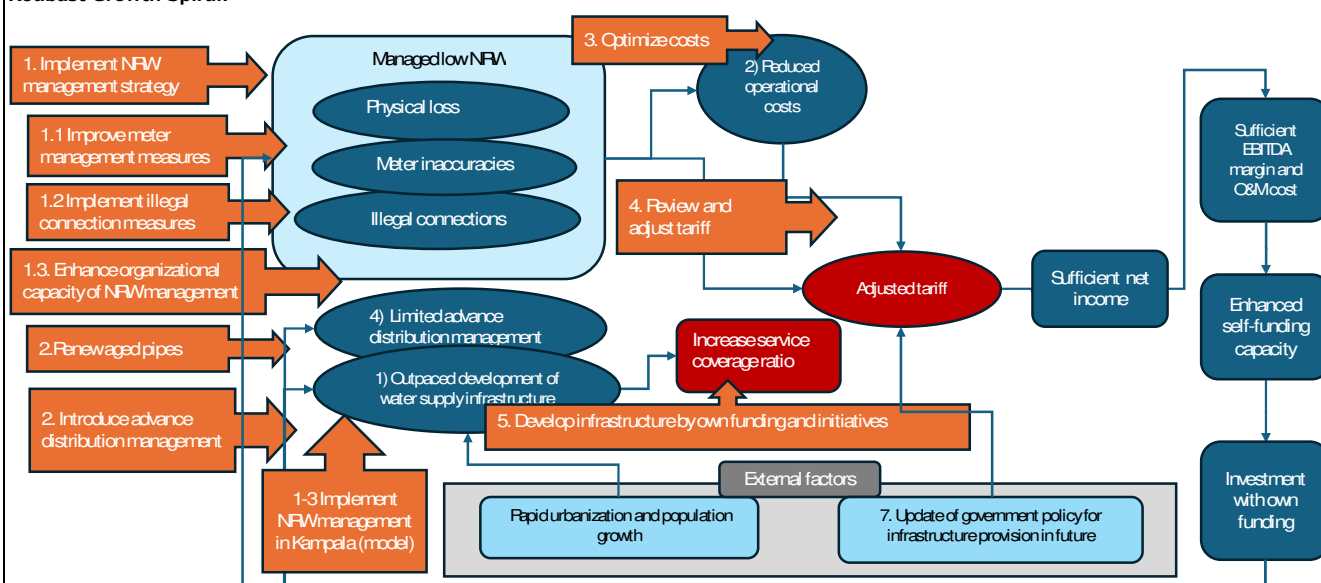
Current Spiral:



Steps to make Growth Spiral work



Roubast Growth Spiral:



6. Potential Solutions

Goals

Overall Goal	To become a leading customer service-oriented utility in the world operating on a commercially and financially sustainable foundation
Mid-term Goal	Internal funding and fundraising capacity is strengthened by enhancing operational efficiency including reducing NRW, optimizing costs, and appropriately adjusting water tariff rates to achieve commercially and financially sustainable management

Outcomes

	Outcomes	Indicator	Target		
			Base line	2030	Long term
1	The capacity for Non-Revenue Water (NRW) management is enhanced.	NRW (%)	35	30	25
2	The aged and outdated transmission and distribution system is modernized and renewed with priority of Kampala.	Leakage rate (%)	17.5	15	12.5
3	A long term plan of cost reduction and revenue generation to improve O&M costs coverage ratio is developed and implemented.	Operating cost coverage rate excluding deferred income (%)	108	130	140
4	A comprehensive long-term financial plan to support capital investments is developed.	Ratio of "Self-financed capital investment" to total capital expenditure (%)	11	20	30

Activities

		Current DPs support & own activities	Target	FY2025	FY2026	FY2027	FY2028	FY2029	Mid-term FY2030	Long-term
1	The capacity for Non-Revenue Water (NRW) management is enhanced.									
	1	Formulate a comprehensive plan for NRW countermeasures (coordinating with 2)	AFD	Short						
	2	Enhance NRW management capacity (commercial loss and physical losses management and human resources)	AFD	Medium						
	3	Implement NRW management activities	MWSC	Medium						
2	The aged and outdated transmission and distribution system is modernized and renewed with priority of Kampala.									
	1	Formulate a replacement plan with zoning and SCADA for distribution network and conduct a feasibility study	AFD	Short						
	2	Raise funds to replace aging pipes	AFD	Medium						
	3	Implement the priority projects outlined in the feasibility study	AFD/MWSC	Long						
3	A long term plan of cost reduction and revenue generation to improve O&M costs coverage ratio is developed and implemented.									
	1	Plan cost optimization measures including NRW reduction and electricity cost reduction		Short						
	2	Plan revenue increase measures including increase of customer base, improvement of collection efficiency, etc.		Short						
	3	Implement the plan		Long						
4	A comprehensive long-term financial plan to support capital investments is developed.									
	1	Develop/update tariff study including affordability analysis		Short						
	2	Formulate a long-term financial plan including prioritizing capital investments from small to large scale		Short						
	3	Develop a fund mobilizing strategy		Short						

Scenario of Improvement

To become a leading customer service-oriented utility in the world operating on a commercially and financially sustainable foundation

Mid-term goal: Strengthen internal funding and fundraising capacity by enhancing operational efficiency to

4. A comprehensive long-term financial plan to support capital investments is developed.

2. The aged and outdated transmission and distribution system is modernized and renewed with priority of Kampala.

1. The capacity for Non-Revenue Water (NRW) management is enhanced.

3. A long term plan of cost reduction and revenue generation to improve O&M costs coverage ratio is developed and implemented.

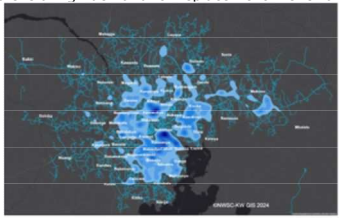
External factors

6) Rapid urbanization and population

7) Government policy for infrastructure provision by the government

3a. Bottleneck analysis (details)

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
Internal Factors	1	Management and finance			
		Accounting consistency and transparency issues			
		Financial statements are made not on the accrual basis of accounting.	☒	☐	
		There is no fixed assets register for financial management	☒	☐	
		Low profitability			
		The water revenue is insufficient to recover O&M costs.	☒	☐	
		The water revenue is insufficient for full-cost recovery including investment cost	☐	☒	Excluding subsidies, O&M cost coverage ratio is 108% and the unit cost of water supply is larger than the supply price, which indicate making sustainable investment difficult. Water tariff is set in accordance with the Water Act, which came into force in 2018. In addition, since water resources are generally abundant and water contributes to industrial development, the tariff for Industrial and Commercial is set on a tapering basis. *1, 2 The construction of water plants and sewage treatment plants is being carried out with assistance (grants) from DPs. Investments in public taps is also being carried out with government subsidies. It has been made clear that large-scale capital investments will be implemented with subsidies mainly from DP's funds.*2
		Unit price of water supply is low	☐	☐	
		Unit cost of water supply is high	☐	☐	-The unit supply cost is 90 cents/m3. It is not low rate.*1 -Electricity costs are high, and staff/labor cost accounts for a high proportion of the total. Although the number of employees is decreasing, staff/labor cost still account for 42% of the total costs.*1
		Process for setting water tariff is not in place			
		Water tariff is not reviewed on a regular basis	☒	☐	
		Water tariff is not revised in response to increases in operating costs such as inflation	☒	☐	The tariff is indexed to the inflation rate, and although it was frozen during the COVID-19 period, it was raised in 2022. Deferred indexation for the previous years (FY 2018/19, FY 2019/20 and FY 2020/21) The current tariff as of December 2023 was set in 2018.
		Insufficient planning and investment funding shortage			
		No business operation plan and facility development plan have been prepared.	☐	☒	According to the three-year corporate plan (2021-2024), NWSC plans to reduce NRW from 37% to 33% over the next five years.*3
		No financial projection of short to long term funds	☒	☐	A five-year corporate plan has been prepared. It is unclear how much the NRW countermeasures cost will be. The budget for NRW countermeasures seems small.*1
		High reliance on external funding such as subsidies in multi-year business plans	☐	☒	Large-scale capital investment is expected to be funded by DPs.
	2	Service provision and maintenance issues			
		The water supply coverage ratio and the population served are not growing.			
		The water supply coverage ratio and the population served are not growing.	☐	☒	The GKMA has witnessed rapid urbanization and population growth in recent years, rising from a population of 2.4 million in 2014 to a population of more than 4 million today. The population growth rate for the region is currently estimated at 5.3% per annum. The recent commissioning of a new water treatment plant at Katosi has helped alleviate this increasing demand. However, the region still faces constraints in terms of bulk transmission, storage and distribution infrastructure required to fully benefit from the increased water production capacity.*15
		Insufficient infrastructure development			
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☒	☐	
		Development of new facilities is not progressing	☒	☐	
		There is a lot of aging infrastructure	☐	☒	There is a high demand for facility renewal. Repairs and renewal require huge amounts of money.*2
		High non-revenue water (NRW) rate			
		Water balance not calculated	☐	☒	The water distribution network may not yet be managed by the DMA, although the phase 2 of WaterWorx project(WOP Uganda, including DMA setting supports) is being implemented during 2022 - 2026, according to VEI (Netherlands) .*4, 7 In Kampala, the NRW rate is 40.4% in March 2024: - Unbilled authorized: 8% - Commercial losses: 21% (Unauthorised: 10.5%, metering inaccuracies: 10.5%) - Physical losses: 16.4%*15 It may be assumed that the physical losses are in the range of 17% of the total annual system input volume, representing around 139 litres lost per connection per day; this translates to a value of approximately UGX 31.7 Bn per year, compared to total annual operating costs of approximately UGX 176 Bn. The Unavoidable Annual Real Losses (UARL) for KW may be realistically estimated at 70 litres per connection per day, which implies that the potentially recoverable physical losses amount to only 69 litres per connection per day (representing 8.4% of the system input volume), which translates to maximum potential savings of approximately UGX 15.7 Bn per year. AFD and other donors: Part of the KW-LV WATSAN project/ Greater Kampala Network Restructuring and Rehabilitation (Procurement) Laying of 60 Km of Transmission mains, 66 Km of secondary mains and 216 Km of tertiary mains, Construction of 4 Booster pumping stations, Construction of 3 Reservoirs of capacity 30 – 200 m3, Installation of District Metering Areas (DMAs) and 41 DMA feeding points, Implementation of a SCADA system for network monitoring at 8 critical stations in the distribution network and linking to the main station at Gaba water works and Re-lifting of existing 30,000 m3 Gushiki reservoir.
		High commercial loss	☐	☒	
		There is no specialized department for managing non-revenue water.	☐	☒	According to the report published in 2021, there is no dedicated department for reducing NRW, and staff members are also engaged in other work, so the number of full-time staff is limited to three plumbers.*4

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		There is no plan to reduce non-revenue water, and no measures have been implemented.	☐	☒	The NRW reduction plan is insufficient. No active NRW countermeasures such as nighttime minimum flow surveys and leak detection have been implemented in any area. Kampala has many deteriorated pipes, high internal pressures that cause water leakage, and meters that do not read in areas with water outages, compared to other areas.*4 NWSC_KW(Kampala Water) NRW Management Strategy July 2021 was prepared for tackling high NRW in Kampala Water. The strategic interventions are as follows:*16 - Structural and function realignment, NRW management module, Tracking un-registered properties &premises, Targeted NRW incentive framework, Strengthening local community engagement in combatting NRW, Enhanced meter management, Revamping WALOPU, Revamping SWALOP programme, Targeted network control improvements, Operation House -to-House Auditing Strategy
		High leakage rate			
		Many leaks are caused by deterioration of water pipes	☐	☒	In Kampala, many water pipes are over 50 years old.*4 There is a high demand for replacement. Renewal requires a huge amount of money. 
		Leak detection is not being carried out systematically	☐	☒	There is no planned leak detection system.*4
		Water pressure distribution is not controlled	☐	☒	Water pressure is not controlled enough. Pressure control is difficult due to the difference in elevation of the terrain.*4
		Insufficient maintenance			
		There is no up-to-date facility inventory for facility O&M	☒	☐	
		Regular maintenance of equipment is not carried out	☐	☐	
		No budgeted maintenance plan	☒	☐	
		No DX implementation and low operational efficiency			
		There is no strategy for implementing digital transformation	☒	☐	
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases, smart meters)	☐	☒	Water distribution is not monitored and controlled by DMA or SCADA.*2
	3	Commercial Operations			
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☒	☐	
		There is no established process for handling complaints, or there are problems with handling complaints	☐	☒	NWSC is responsible for urban areas across the country, so if a problem such as a leak, water cut or damage to equipment occurs in a remote area, it takes time and money for the head office to respond. Responding to customer complaints and enquiries also takes time because they are handled by the relevant department at head office. *2
		Low collection ratio	☒		
		The water tariff collection process (including unpaid fees) is not effective/efficient	☒	☐	Although the collection rate is 98% (FY2022/23)*1, accounts receivable are six months from sales, so collection is taking time. Main delayed payment customers are government agencies.
		The payment method is inconvenient for customers (customers have some complaints)	☒	☐	
	4	Organization and Human Resource Management Issues			
		Shortage of engineers and skills gap			
		There is a shortage of engineers with specialized knowledge	☐	☒	As the high NRW ratio (mainly leakage ratio) in the capital Kampala shows, the technical level of leakage countermeasures is still insufficient. Most leaks are detected by visual inspection of surface leaks, and although they have equipment (such as listening sticks and leak detectors) for detecting underground leaks, the number of staff who can use the equipment is limited.*4

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		No skills and training strategy or plan	☐	☒	Human resource development and capacity building are emphasized as one of the priority areas for the NWSC as a whole, and training is being actively developed as a wide-ranging and systematic activity. The formulation of a five-year capacity development plan is progressing, and the development of instructors and curricula is also being carried out on an ongoing basis. *6
		Regular training and development programs are not provided adequately.	☐	☒	However, there are areas that need further training course development, such as dealing with new issues such as water source and groundwater management, sewage treatment, and NRW management, where there is room for on-site business improvement. Along with the development of courses, it is necessary to prepare teaching materials, train lecturers, and prepare training equipment and materials.*6
		Declining organizational efficiency			
		There is no annual evaluation and goal setting system for staff	☒	☐	
		Performance-based rewards and promotions are not implemented in the personnel system	☒	☐	
		No power to hire and fire staff (within the bounds of an agreed	☒	☐	
		Lack of strategic management capabilities in the organization			
		Not setting and monitoring enough Key Performance Indicators	☒	☐	
		Specific targets and deadlines associated with each strategic objective are not clearly defined.	☒	☐	
		There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☒	☐	
		Governance issues			
		Important decision-making processes are not clear and are not made in a collegial manner.	☒	☐	
		The division of responsibilities within the organization is not clear.	☒	☐	
External factors	5	Environment (Water Sources)			
		Depletion of water sources and deterioration of water quality			
		Water sources are unstable (there is no stable water source)	☒	☐	
		Water sources are over-exploited (unsustainable)	☒	☐	
		Water sources are affected by pollution and climate change	☐	☒	Kampala Water Supply is responsible for 62% of the total water supply, and its water source is Lake Victoria, but the water quality is constantly fluctuating due to morning and evening temperature changes, seasonal changes, and the effects of the wind. Water pollution caused by river inflows into the lake is also an issue, and the protection of water sources is considered to be important.*2
	6	Government systems and politics			
		Tariff policy issues			
		No medium- to long-term basic policy for the country's water sector	☒	☐	The government places emphasis on affordability of the water tariff.
		The purpose of the subsidy is unclear	☒	☐	In line with the government's strategic goal of 100% service coverage, NWSC has been implementing the 100% Service Coverage Acceleration Project (SCAP100) since 2017, which aims to ensure universal and equitable safe water supply to all residents in all villages under NWSC's jurisdiction.*4
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☒	☐	Although it has an independent accounting system, the performance contract clearly states that facility investment and assistance to the poor will be carried out with subsidies from the government and DP. Although this is the goal, water tariffs are at a level that cannot cover the investment costs.*5
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc.).	☒	☐	NWSC is one of "Extra budgetary units" which are not allowed to raise funds through issuance of loans or guarantees without an authorization from the Minister of Finance.
		Regulation of water utilities does not function properly	☒	☐	The performance contract clearly states that NWSC's business responsibility, including facility investment and support for the poor, will be implemented with subsidies from the government and DP.
		The utility does not have the power to make personnel decisions	☒	☐	
	7	Development Partner (DP) Support			
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☒	☐	

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		There is no continued donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☒	☐	DP supports facility development. Financial support for NRW measures started since 2021. NWSC expects to continue receiving support largely from DPs. The total resources expected from the external sources (Government, DPs and Market finance) over the period (2024-2029) amounts to Shs 4.371 trillion, with 82% expected from the DPs.*1 AFD and other donors: Part of the KW-LV WATSAN project is scheduled to start on 15 November 2024*8, *17 1) Upgrading and Rehabilitation of the Gaba Water Treatment Complex (Completed) 2) Construction of the Katosi Drinking Water Treatment Plant (160,000 m3/day) (Completed) 3) Greater Kampala Network Restructuring and Rehabilitation (Procurement) 4) Improvement of Water Supply and Sanitation Services in Informal Settlements (Progress) AfDB: Water Supply & Sanitation Project Phase III(-2025) The program supports water supply and sanitation in urban and rural areas nationwide. Key activities include constructing water systems, rehabilitation of water for production earth dams, and implementing catchment management for climate resilience. Sanitation efforts focus on eco-friendly toilets and hygiene promotion. Program management includes planning, monitoring, capacity building, gender and HIV/AIDS mainstreaming, environmental safeguards, and promoting youth and women's empowerment.*9~11 WB: Integrated Water Management and Development Project(-2026) The Adjumani Integrated Water Management and Development Project is part of the broader Integrated Water Management and Development Project (IWMDP) supported by the World Bank. The project aims to improve access to water supply and sanitation services, enhance integrated water resources management, and boost the operational performance of water and sanitation service providers in targeted areas.*12 KfW, WB: Integrated programme to improve living conditions in Gulu, Phases I and II Uganda(-2025) The project aims to enhance the quality of life in Gulu, the second largest city, and surrounding areas. This program focuses on improving water supply, sanitation, solid waste management, and urban infrastructure.*13,14
			☐	☐	AFD, which had not previously engaged in technical cooperation, agreed in December 2024 to address NRW issues, focusing on Kampala. The contractors for this initiative are SUEZ and SOGEA. The project is scheduled to commence in January 2025, with a launch ceremony planned. The strategy will be developed, including SCADA implementation, and equipment will also be provided. The total budget is 6 million euros, comprising 2.7 million euros for technical cooperation costs and 3.3 million euros for equipment provision. <u>This initiative is part of the Kampala Water, Lake Water, and Sanitation Project.</u>
		No continued donor support for capacity development projects	☒	☐	AfDB: Water Supply & Sanitation Project Phase III(See above content) AfDB primarily conducts capacity building to strengthen sectors and enhance ownership. By reviewing the systems established by each sector, AfDB collaborates with them to develop capacity building programs.*4 DPs support such as WB include capacity development.
	8	Socioeconomy			
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate)	☒	☐	-The inflation rate in June 2024 recorded 3.9%, driven by rising energy prices according to IMF. The Bank of Uganda's inflation target is 5%. - The potential of climate related shocks is pointed out by IMF.
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☒	☐	
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☒	☐	The benchmark interest rate set by the Central Bank of Uganda is 9.75% as of October 2024.

Note: Blue color indicates recommendation or plan in the existing documents and red color indicate major issues identified by JICA Study Team through this analysis.

Boundary	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Source			
	※ 1	Corporate-Plan-2024-2027-Final			
	2	アフリカ地域「成長する水道事業者」支援におけるプラットフォーム活動情報収集確認調査 ケース事業体分析 2023 年 2 月			
	3	NWSC_AmendedCorpPlan21-24_May2022			
	4	ウガンダ国都市環境分野（都市給水・大気汚染）に係る情報収集・確認調査 ファイナルレポート 2021 年11 月			
	5	Performance Contract			
	6	ウガンダ国「水と衛生のアフリカ域内研修ハブ強化プロジェクト（仮）」情報収集調査 報告書 2024年6月			
	7	WaterWorX project: WOP Uganda, VEI (https://www.vei.nl/projects/waterworx-project-wop-uganda)			
	8	https://ubc.go.ug/2024/09/13/one-million-to-benefit-as-government-commences-ugx-373-billion-water-project-in-greater-kampala/			
	9	https://www.mwe.go.ug/projects/water-supply-sanitation-project-phase-iii			
	10	https://www.afdb.org/en/documents/uganda-water-supply-and-sanitation-programme-phase-iiiwssp-iii-p-ug-e00-019			
	11	https://www.afdb.org/sites/default/files/water_supply_sanitation_project_iii_stakeholder_engagement_plan.pdf			
	12	https://projects.worldbank.org/en/projects-operations/project-detail/P163782			
	13	Integrated urban development KfW Development Bank			
	14	Integrated Programme to Improve the Living Conditions in Gulu and Small Towns en Route in the Victoria Nile Catchment (IPLC), Engineering and Institutional Consultant (EIDC) GOPA Infra			
	15	ANALYSIS OF PHYSICAL LOSSES IN KAMPALA WATERDr. Frank Kizito, CMAMMarch 2024			
	16	NWSC_KW NRW Management Strategy_July 2021			
	17	Profiling Our Key Development Partners and Projects Performance as of June 2024			

0. Benchmark

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (Currency)	–	–	–	–
		2	Production capacity (m³/day)	–	–	–	–
		3	Production (m³/day)	–	–	–	–
		4	Utilization ratio of production capacity (%)	–	–	–	–
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	–
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	–
		8	Leakage ratio (%)	–	–	–	–
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	–
		12	Water sold (m³/day)	–	–	–	–
		13	Water consumption per capita per day (L/c.a/day) (sold water/service population)	–	–	–	–
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%(15-25%)	Less than 15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (6m³/USD)	–	–	Aim for a level of sustainable investment	–
Prerequisites	4. Improved financial management	19	Accounting system	–	–	Accural basis/corporate accounting	–
Profitability		20	Net income (Currency)	–	–	–	–
		21	EBITDA (Currency)	–	–	–	–
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	–
		23	EBITDA margin excluding deferred income (%)	Negative	0%-40%	Aim for 40% or more	–
		24	Total capital operating margin (%)	–	–	–	–
		25	Operating Profit Margin(%)	Negative	Less than 10%	Aim for 10% or more	–
Financial soundness		26	Equity ratio (%)	–	Less than 40%	Aim for 40% or more	–
		27	Fixed long term conformity rate (%)	–	Above 100%	Aim for less 100%	–
		28	O&M cost coverage ratio including subsidies/ grants and excluding depreciation (%)	Less than 100	100-130	Above 130	–
		29	O&M cost coverage ratio excluding subsidies/grants and depreciation (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency/m³) (Overall cost including depreciation/Water sold)	–	–	–	–
		31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	–	–	–	–
			Overall cost excluding depreciation expense	–	–	–	–
			Overall cost including depreciation expense	–	–	–	–
		32	Subsidies (Currency)	–	–	–	–
		33	Development Partner grant support (Currency)	–	–	–	–
		34	The ratio of subsidies and DP support to turnover	–	–	–	–
		Human resource efficiency	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5

Unit:UGX'000

UGX = USD

0.00027

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

Thousand UGX		2021/6	2022/6	2023/6
	Water and sewerage income	376,170,941	424,100,369	466,179,288
	Other incomes	9,268,693	3,467,075	4,097,925
	Investment income	79,849	143,307	-
	Deferred income	75,297,248	91,571,697	79,761,556
Assumption	Total Income	460,816,731	519,282,448	550,038,769
Fixed	Employee Benefit expenses	150,048,611	167,572,661	176,115,337
Fixed	Administrative Cost	46,975,959	66,676,643	62,469,470
				3,645,350
Variable	Static Plant and Pipe Network	100,428,234	108,845,453	113,247,631
Variable	Supplies and Services	31,336,176	32,223,996	37,061,793
Variable	Premises Maintenance	10,916,970	9,617,582	11,099,953
Fixed?	Transport & Mobile Plant	14,671,349	11,602,154	15,391,439
	Total expenditure before Depreciation	354,377,299	396,538,489	419,030,973
	Operating Profit Before Depreciation	106,439,432	122,743,959	131,007,796
	Depreciation and amortisation	(87,763,893)	(124,072,013)	(98,704,385)
	Operating profits before finance costs	18,675,539	(1,328,054)	32,303,411
	Net financial cost	(6,954,959)	(9,746,170)	(11,293,952)
	Net (Loss) Profit Before Tax	11,720,580	(11,074,224)	21,009,459
	Tax Credit/ (Charge)	36,068,585	(27,791,920)	19,777,751
	Profit (Loss) for the year	47,789,165	(38,866,146)	40,787,210
Financial indicators				
	EBITDA	106,439,432	122,743,959	131,007,796
	EBITDA Margin	23%	24%	24%
	EBITDA Margin(excluding deferred income)	8%	7%	11%
	ROA (Operating profit/asset)	2.8%	3.0%	2.8%
	Ordinary profit margin	3%	-2%	4%
	Operating cost (excluding depreciation) = O&M cost	354,377,299	396,538,489	419,030,973
	O&M coverage ratio (excluding deferred income)	109%	108%	112%
	O&M coverage ratio(including all income)	130%	131%	131%
	Overall cost including depreciation expense excluding finance cost	442,141,192	520,610,502	517,735,358
	Labor and staff costs vs O&M costs			
	(Labor and staff costs)/(O&M costs)	42%	42%	42%

source : NWSC-Annual-Report-202122.pdf

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

1	Current NRW is 34.9% (Physical 17.5% and non-physical 17.5%) Reduced NRW is 25% (Physical loss 12.5% and non-physical loss 12.5%)
2	Reducing non-physical water losses directly increases revenue.
3	Reducing physical water losses lowers variable costs such as pump operation and treatment costs, even if the recovered water is not sold.

Financial benefits assuming reduction of NRWComposition
of NRW

Actual	Total production	m3/annual			
Actual	Total supply volume per annum	m3/annual	137,230,027	157,891,393	161,559,152
Actual	Water volume sold (Revenue water)	m3/annual	89,777,728	101,934,959	105,155,216
Actual	NRW volume	m3/annual	47,452,299	55,956,434	56,403,936
Actual	NRW ratio	%	34.6	35.4	34.9
Assumed	NRW ratio by physical loss	%	17.3	17.7	17.5
Assumed	NRW ratio by non-physical loss	%	17.3	17.7	17.5
Calculated	NRW by physical loss	m3/annual	23,726,150	27,978,217	28,201,968
Calculated	NRW by non-physical loss	m3/annual	23,726,150	27,978,217	28,201,968
Assumed	Target NRW ratio	%	25	25	25
Assumed	NRW ratio by physical loss	%	12.5	12.5	12.5
Assumed	NRW ratio by non-physical loss	%	12.5	12.5	12.5
Calculated	NRW by physical loss	m3/annual	17,153,753	19,736,424	20,194,894
Calculated	NRW by non-physical loss	m3/annual	17,153,753	19,736,424	20,194,894
Calculated	Water saved from NRW reduction by physical loss	m3/annual	6,572,396	8,241,793	8,007,074
Calculated	Water saved from NRW reduction by non-physical loss	m3/annual	6,572,396	8,241,793	8,007,074
Unit cost and unit tariff rate					
Calculated	Unit cost (All expenses/sold water volume)	UGX/m3	5,002	5,203	5,031
Calculated	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	UGX/m3	3,947	3,890	3,985
Calculated	Unit variable cost -Variable costs/sold water volume	UGX/m3	1,589	1,478	1,217
Calculated	Unit price - Water & sewerage income/sold water volume	UGX/m3	4,190	4,160	4,433
Saved cost and increased sales		Unit:UGX'000			
Calculated	Cost saved from NRW reduction by physical loss	UGX/annual	10,445,336	12,183,566	9,746,059
Calculated	Revenue generated from NRW reduction by non-physical loss	UGX/annual	27,538,505	34,289,977	35,497,355
Calculated	Total value of revenue increased and costs saved by NRW reduction	UGX/annual	37,983,841	46,473,543	45,243,414
Total calculated income and expenditure		Unit:UGX'000			
Calculated	Total Income	UGX/annual	488,355,236	553,572,425	585,536,124
Calculated	Total expenditure before Depreciation	UGX/annual	343,931,963	384,354,923	409,284,914
Calculated profits		Unit:UGX'000			
Calculated	Operating Profit Before Depreciation	UGX/annual	144,423,273	169,217,502	176,251,210
Calculated	Operating profits before finance costs	UGX/annual	56,659,380	45,145,489	77,546,825
Calculated	Net (Loss) Profit Before Tax	UGX/annual	49,704,421	35,399,319	66,252,873

Calculated	Profit (Loss) for the year	UGX/annual	85,773,006	7,607,399	86,030,624
Financial indicators assuming NRW reduction (25%)					
EBITDA			144,423,273	169,217,502	176,251,210
EBITDA Margin			30%	31%	30%
EBITDA Margin(excluding deferred income)			17%	17%	19%
ROA (Operating profit/asset)			3.5%	4.1%	4.3%
Ordinary profit margin			10%	6%	11%
Operating cost (excluding depreciation)			343,931,963	384,354,923	409,284,914
O&M coverage ratio (excluding deferred income)			120%	120%	124%
O&M coverage ratio(including all income)			142%	144%	143%
Overall cost including depreciation expense excluding finance cost			431,695,856	508,426,936	507,989,299
Financial indicators (Original)					
EBITDA			106,439,432	122,743,959	131,007,796
EBITDA Margin			23%	24%	24%
EBITDA Margin(excluding deferred income)			8%	7%	11%
ROA (Operating profit/asset)			2.8%	3.0%	2.8%
Ordinary profit margin			2.5%	-2.1%	3.8%
Operating cost (excluding depreciation)			354,377,299	396,538,489	419,030,973
O&M coverage ratio (excluding deferred income)			109%	108%	112%
O&M coverage ratio(including all income)			130%	131%	131%
Overall cost including depreciation expense excluding finance cost			442,141,192	520,610,502	517,735,358

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

Thousand UGK (1,000 UGK)		2021/6	2022/6	2023/6
	Water and sewerage income	376,170,941	424,100,369	466,179,288
	Other incomes	9,268,693	3,467,075	4,097,925
	Investment income	79,849	143,307	-
	Deferred income	75,297,248	91,571,697	79,761,556
	Total income	460,816,731	519,282,448	550,038,769
Fixed	Employee Benefit expenses	150,048,611	167,572,661	176,115,337
Fixed	Administrative Cost	46,975,959	66,676,643	62,469,470
				3,645,350
Variable	Static Plant and Pipe Network	100,428,234	108,845,453	113,247,631
Variable	Supplies and Services	31,336,176	32,223,996	37,061,793
Variable	Premises Maintenance	10,916,970	9,617,582	11,099,953
Variable	Transport & Mobile Plant	14,671,349	11,602,154	15,391,439
	Total expenditure before Depreciation	354,377,299	396,538,489	419,030,973
	Operating Profit Before Depreciation	106,439,432	122,743,959	131,007,796
	Depreciation and amortisation	(87,763,893)	(124,072,013)	(98,704,385)
	Operating profits before finance costs	18,675,539	(1,328,054)	32,303,411
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	Net (Loss) Profit Before Tax	11,720,580	(11,074,224)	21,009,459
	Tax Credit/ (Charge)	36,068,585	(27,791,920)	19,777,751
	Profit (Loss) for the year	47,789,165	(38,866,146)	40,787,210
Financial indicators				
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	EBITDA Margin	23%	24%	24%
	EBITDA Margin(excluding deferred income)	8%	7%	11%
	ROA (Operating profit/asset)	2.8%	3.0%	2.8%
	Ordinary profit margin	3%	-2%	4%
	Operating cost (excluding depreciation) = O&M cost	354,377,299	396,538,489	419,030,973
	O&M coverage ratio (excluding deferred income)	109%	108%	112%
	O&M coverage ratio(including all income)	130%	131%	131%
	Overall cost including depreciation expense excluding finance cost	442,141,192	520,610,502	517,735,358
	Labor and staff costs vs O&M costs	42%	42%	42%
	(Labor and staff costs)/(O&M costs)			

source : NWSC-Annual-Report-202122.pdf

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 2)

1	Current NRW is 34.9% (Physical 17.5% and non-physical 17.5%) Reduced NRW is 25% (Physical loss 12.5% and non-physical loss 12.5%)
2	Reducing both physical and non-physical water losses leads to increased revenue.

Financial benefits assuming reduction of NRW					Composition of NRW
Actual	Total production	m3/annual			
Actual	Total supply volume per annum	m3/annual	137,230,027	157,891,393	161,559,152
Actual	Water volume sold (Revenue water)	m3/annual	89,777,728	101,934,959	105,155,216
Actual	NRW volume	m3/annual	47,452,299	55,956,434	56,403,936
Actual	NRW ratio	%	34.6	35.4	34.9
Assumed	NRW ratio by physical loss	%	17.3	17.7	17.5
Assumed	NRW ratio by non-physical loss	%	17.3	17.7	17.5
Calculate	NRW by physical loss	m3/annual	23,726,150	27,978,217	28,201,968
Calculate	NRW by non-physical loss	m3/annual	23,726,150	27,978,217	28,201,968
	Assumed Target NRW ratio	%	25	25	25
Assumed	NRW ratio by physical loss	%	12.5	12.5	12.5
Assumed	NRW ratio by non-physical loss	%	12.5	12.5	12.5
Calculate	NRW by physical loss	m3/annual	17,153,753	19,736,424	20,194,894
Calculate	NRW by non-physical loss	m3/annual	17,153,753	19,736,424	20,194,894
Calculate	Water saved from NRW reduction by physical loss	m3/annual	6,572,396	8,241,793	8,007,074
Calculate	Water saved from NRW reduction by non-physical loss	m3/annual	6,572,396	8,241,793	8,007,074
Unit cost and unit tariff rate					
Calculate	Unit cost (All expenses/sold water volume)	UGX/m3	5,002	5,203	5,031
Calculate	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	UGX/m3	3,947	3,890	3,985
Calculate	Unit variable cost -Variable costs/sold water volume	UGX/m3	1,589	1,478	1,535
Calculate	Unit price - Water & sewerage income/sold water volume	UGX/m3	4,190	4,160	4,433
Saved cost and increased sales					
Calculate	Revenue generated from NRW reduction by physical loss	UGX/annua	27,538,505	34,289,977	35,497,355
Calculate	Revenue generated from NRW reduction by non-physical loss	UGX/annua	27,538,505	34,289,977	35,497,355
Calculate	Total value of revenue increased and costs saved by NRW reduction	UGX/annua	55,077,011	68,579,954	70,994,710
Total calculated income and expenditure					
Calculate	Total Income	UGX/annua	515,893,742	587,862,402	621,033,479
Calculate	Total expenditure before Depreciation	UGX/annua	354,377,299	396,538,489	419,030,973
Calculated profits					
Calculate	Operating Profit Before Depreciation	UGX/annua	161,516,443	191,323,913	202,002,506

Calculate Operating profits before finance costs	UGX/annua	73,752,550	67,251,900	103,298,121
Calculate Net (Loss) Profit Before Tax	UGX/annua	66,797,591	57,505,730	92,004,169
Calculate Profit (Loss) for the year	UGX/annua	102,866,176	29,713,810	111,781,920

Financial indicators assuming NRW reduction (25%)

EBITDA		161,516,443	191,323,913	202,002,506
EBITDA Margin		31%	33%	33%
EBITDA Margin(excluding deferred income)		20%	20%	23%
ROA (Operating profit/asset)		4.0%	4.7%	4.9%
Ordinary profit margin		13%	10%	15%
Operating cost (excluding depreciation)		354,377,299	396,538,489	419,030,973
O&M coverage ratio (excluding deferred income)		124%	125%	129%
O&M coverage ratio(including all income)		146%	148%	148%
Overall cost including depreciation expense excluding finance cost		442,141,192	520,610,502	517,735,358

Financial indicators (Original)

EBITDA		106,439,432	122,743,959	131,007,796
EBITDA Margin		23%	24%	24%
EBITDA Margin(excluding deferred income)		8%	7%	11%
ROA (Operating profit/asset)		2.8%	3.0%	2.8%
Ordinary profit margin		2.5%	-2.1%	3.8%
Operating cost (excluding depreciation)		354,377,299	396,538,489	419,030,973
O&M coverage ratio (excluding deferred income)		109%	108%	112%
O&M coverage ratio(including all income)		130%	131%	131%
Overall cost including depreciation expense excluding finance cost		442,141,192	520,610,502	517,735,358

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnosis and Potential Solutions -
Lilongwe Water Board (LWB)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



List of Sheets

S. Overall Summary

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
7. Comparison with BWB (Financial Comparison between LWB and
- 3a. Bottleneck analysis (details)
0. Benchmarks
- 7.1. PL-NRW1 (NRW reduction benefit- Case 1)
- 7.2. PL-NRW2 (NRW reduction benefit- Case 2)

S. Overall Summary of Diagnostics and Potential Solution

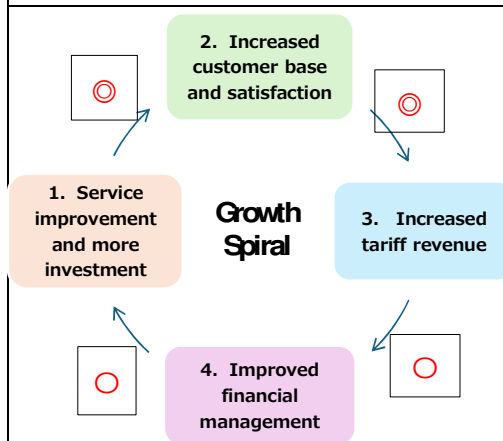
Utility name : Lilongwe Water Board(LWB)

Summary of Growth Spiral diagnostics*1

The four spiral components are working or working well in FY2023/24. While the LWB is on growth spiral, the 68% of increase of water revenue was composed by tariff hike in the FY2023/2024. In addition, the O&M cost coverage ratio only recorded slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. This suggests the needs of improvement of efficiency.

Thus, the followings are concern for all spirals to continuously work well in near future.

- The progress of capital investment for increase production capacity given the high utilization ratio of water production capacity.
- Operation efficiency improvement including measure against high NRW ratio.
- The possibility of regular tariff adjustments, given the over 20% inflation rate.



*1: Refer to "4.GS diag"

Legend

- Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "3.Summary of bottleneck analysis"

1) High Utilization of Water Production Capacity & Rising Demand

A new 50,000 m³/day water treatment plant is under construction but will only meet demand until 2027. Alternative water sources, including treated water from Lake Malawi, are being explored.

2) Persistently High Non-Revenue Water (NRW) Ratio

NRW stands at 41%, with 25% from physical losses due to aging asbestos cement (AC) and galvanized iron (GI) pipes. Recent NRW reduction projects (JICA, World Bank) have shown positive results, but continued efforts are needed. 429 km of old pipelines have been replaced, but 400 km still require urgent renewal.

3) Unregulated Tariff Adjustment Process

Tariffs were only revised twice (Nov 2021 & Aug 2023) since 2018, with no automatic adjustment mechanism. Tariff changes require Ministry of Water approval, leading to uncertainty and potential financial risks. There is a risk that future tariff increases may not keep pace with inflation and economic changes.

4) Delayed Payments by Government Institutions

Government institutions have a low on-time bill payment ratio, negatively impacting cash flow, especially under high inflation. Accelerated collection efforts are needed to mitigate financial risks.

5) Unmanaged Watershed for Water Supply Sources

Deforestation, urbanization, and agriculture are increasing silt inflow, leading to higher turbidity and sediment accumulation at the intake system during the rainy season, affecting operational efficiency. Stronger watershed management (catchment protection, afforestation, erosion control) is essential for long-term water security.

6) Macroeconomic Challenges & High Inflation

Inflation and currency devaluation are straining financial sustainability.

7) Need for Cooperation with Local Government

LMB aims to expand its service area and requires local government cooperation to identify new water supply areas.

Summary of Recommendations for Improvement

Refer to "5.Strategy analysis"

Overall Goal:

"To be a leading, customer-focused, financially viable water and sanitation utility"

- LWB is a leading utility in Malawi and should take the lead in supporting other utilities in the country to advance and develop the water supply sector. This effort will position LWB as a leading utility not only in Malawi but also across Africa.

Mid-Term Goal:

"Water supply reliability along with financial sustainability is further enhanced"

Key Strategies for Sustainable Growth

Sustaining High Financial Performance for Long-Term Growth

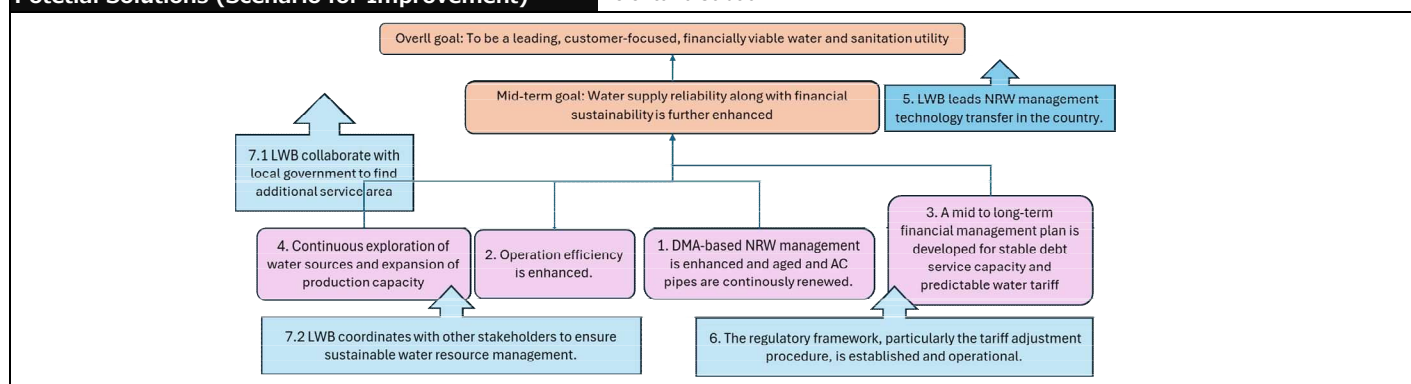
Strengthening NRW Reduction Efforts

Timely and Affordable Tariff Adjustments

Addressing External Challenges

Potential Solutions (Scenario for Improvement)

Refer to "6.Solution"



1. Diagnostics based on indicators (Index diag)

(3, 10, 50)

Unit: Tausd local currency

Unit: / thousand local currency																									
Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Calculation	Utility name: LWB				Improvement trend	Stage of growth				Year				Source			Remarks (Additional information)	Initial diagnosis by indicator			
					2020/21	2021/22	2022/23	2023/24		2020/21	2021/22	2022/23	2023/24	1	2	3	4	1	2	3			4		
Service level	Service Improvement and Investment Activities	1	Investment cost (Currency)	Payments to acquire tangible assets	28,772,328	17,809,355	37,244,095	42,632,508	↗	-	-	-	-	20/21	21/22	22/23	23/24	A	A	A	A				
		2	Production capacity (m ³ /day)	-	125,000	125,000	125,000	125,000	→	-	-	-	-	20/21	21/22	22/23	23/24	A	A	A	A		Production capacity is constant and no new water treatment plants has not been contracted.		
		3	Production (m ³ /day)	-	106,157	78,214	103,937	112,383	↗	-	-	-	-	20/21	21/22	22/23	23/24	C	C	C	C		Increasing year by year; the operation of water treatment plant is progressing.		
		4	Utilization ratio of production capacity (%)	-	85	63	83	90	↗	-	-	-	-	20/21	21/22	22/23	23/24	A	A	A	A		90% of utilization ratio indicates that there is not enough production to extend coverage in future.		
		5	Continuity of Service (Hrs/day)	-	22	18	22	22	→	2	2	2	2	20/21	21/22	22/23	23/24	A	A	A	A		Not increasing		
		6	Quality of water supplied (Compliance rate: %)	-		96	97	97	→	NA	4	4	4	4	20/21	21/22	22/23	23/24	B	B	B	B	samples passing on residual chlorine (Monthly average ratio)	Residual chlorine is in compliance.	
		7	Water supply pressure	-		7	3	3	-	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B	The approximate percentage of the customers in low water pressure area			
		8	Leakage ratio (%)	-	26.9	22.7	24.8	25.1	→	-	-	-	-	20/21	21/22	22/23	23/24	C	C	C	C				
Business scale	Customer Increase and Trust	9	Population served	-	930,770	983,219	1,077,114	1,120,085	↗	-	-	-	-	20/21	21/22	22/23	23/24	E	E	E	E		Increasing year by year		
		10	Nums of connections	-	93,496	101,900	115,131	134,338	↗	-	-	-	-	20/21	21/22	22/23	23/24	E	E	E	E				
		10	Service coverage / Water coverage (%)	Served population / Population in the service area	83.0	86.4	90.0	95.0	↗	3	3	3	4	20/21	21/22	22/23	23/24	A	B	A	A		Increasing year by year		
		11	Customer satisfaction (%)	-			76		↗	NA	NA	2	NA			22/23				D	Compared to the previous two CSSs (19% in 2016, 64% in 2019) shows that LWB has improved in performance by 12% since the last survey.	100% of customer complaints have been addressed, but not sure of the quality of the response and how long it takes			
		12	Water sold (m ³ /day)	-	60,885	47,154	61,143	66,394	↗	-	-	-	-	20/21	21/22	22/23	23/24	C	C	C	C				
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	Water sold / Served population	65.4	63.9	56.8	59.3	→	-	-	-	-	20/21	21/22	22/23	23/24	C	C	C	C	Converted from 9 months' figure to 12 months in 2022			
Cost-effectiveness	Water Tariff Profitability Improvement	14	Turnover from sales	Revenue from water service	21,183,251	18,546,956	29,792,204	37,959,605	↗	-	-	-	-	20/21	21/22	22/23	23/24								
		15	Collection ratio (%)	-	82	100	86	95	↗	2	4	2	3	2020	2021	2022	2023	E	E	E	E		Fluctuating but high		
		16	Non-revenue water ratio(%)	-	42.6	39.7	41.2	40.9	→	1	2	1	1	2020	2021	2022	2023	C	C	C	C		NRW remains high, and the effectiveness of the measures does not seem to be quantified.		
		17	Metering ratio (%)	-	100	100	100	100	→	4	4	4	4	2020	2021	2022	2023	A	A	A	A		Very high		
		18	Water tariff level (USD/6m ³)	-	-	-	-	2.55	-	-	-	-	-			2021	2023								
Prerequisites	Management and Financial Improvement	19	Accounting system	-	Accrual accounting	Accrual accounting	Accrual accounting	Accrual accounting	→	3	3	3	3	20/21	21/22	22/23	23/24	B	B	B	B				
20		Net income (Currency)	-	1,018,284	-108,733	708,266	33,691,431	↗	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
21		EBITDA (Currency)	Gain/Loss before tax + Finance cost + Depreciation + Amortization	6,535,242	5,116,682	8,891,959	20,975,869	↗	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
22		EBITDA margin (%)	EBITDA / Income (Sales)	30.9	27.6	29.8	55.3	↗	2	2	2	3	20/21	21/22	22/23	23/24	B	B	B	B		The sudden EBITDA margin improvement in FY2023/2024 is caused by onetime exchange gain.			
23		EBITDA margin excluding deferred income (%)	(EBITDA - Deferred income) / Income (Sales)	18.1	20.2	23.7	50.3	↗	2	2	2	3	20/21	21/22	22/23	23/24	B	B	B	B					
24		EBITDA margin excluding deferred income and exchange gain unrealised	(EBITDA - Exchange loss) / Income (Sales)	18.1	20.2	15.2	22.4	↗	2	2	2	2	20/21	21/22	22/23	23/24	B	B	B	B	Exchange gain is impacting the EBITDA margin				
25		Total capital operating margin (%)	Operating profit incl. deferred income / Total asset	2.3	2.3	1.9	3.2	↗	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
26		Operating Profit Margin(%)	Operating profit incl. deferred income / Total income	5.6	3.6	9.1	39.2	↗	2	2	2	3	20/21	21/22	22/23	23/24	B	B	B	B					
27		Equity ratio (%)	Equity / Total asset	30.1	26.4	20.9	26.0	↗	2	2	2	2	20/21	21/22	22/23	23/24	B	B	B	B					
28		Fixed long term conformity rate (%)	Fixed asset / Fixed liability	84.8	85.4	78.4	81.1	↗	3	3	3	3	20/21	21/22	22/23	23/24	B	B	B	B					
29		O&M cost coverage ratio (%)	(Operating income) / Operating cost (incl. administration cost, excl. dep)	131	134	124	134	↗	3	3	2	3	20/21	21/22	22/23	23/24	B	B	B	B	This is a level to allow capital expenditure				
30		O&M cost coverage ratio excluding subsidies (%)	(Operating income excl.deferred income) / Operating cost (incl. administration cost, excl. dep)	116	125	117	127	↗	2	2	2	2	20/21	21/22	22/23	23/24	B	B	B	B					
31		Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	Overall cost including DEP/Water volume sold	1,064	1,141	1,453	1,498	→	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
32		Supply price (Currency/m ³) (Turnover from sales/ Water sold)	Turnover from sales/ Water volume sold	953	1,078	1,335	1,566	↗	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B	It was only the last financial year that the supply price exceeded unit cost.				
33		Overall cost excluding depreciation expense	Operating cost excl. dep.	20,799,053	17,536,530	29,390,749	35,175,747	-	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
34		Overall cost including depreciation expense	Operating cost excl. dep.	23,635,323	19,631,678	32,416,296	36,302,478	-	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B	The increase of depreciation suggests increase of asset				
35		Subsidies (Currency)	Deferred governmental subsidies in P/L	0.0	0.0	0.0	0.0	→	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B					
Financial soundness			33	Development Partner grant support (Currency)	Deferred DP's grant in P/L	2,131,378	1,297,069	1,558,143	1,611,248	↗	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B		The grant is not major income	
	34		The ratio of subsidies and DP support to turnover (%)	Deferred subsidies + grant / total income	10	7	5	4	→	-	-	-	-	20/21	21/22	22/23	23/24	B	B	B	B		The subsidy is not major income		
	35		Number of staff per 1,000 connections	-	8	5	5	5	→	2	3	3	3	20/21	21/22	22/23	23/24	B	B	B	B		This number is low, suggesting that efficient maintenance and management are being carried out.		
HR efficiency																									
																				</					

* Note the FY2021/2022 was ended on June, the duration is only 9 months. From the next financial year, it ends on March.

* Operating expense is comprised by Cost of sales and Administrative expenses

Source
A 2_1_LWB_UTILITY (JICA)
B Annual reports
C Quarterly & Annual Water Balance LWB: 16 Dec 2024)
D 2022 Lilongwe Water Board Customer Satisfaction Survey
E Population served, the number of customers and coverage rates (LWB, received 19th Dec 2024)

2. Analysis based on financial statements (FS analysis)

Summary

- The O&M cost coverage ratio recorded slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. The O&M cost coverage ratio excluding subsidies is 127%, indicating it is relatively less dependent on government subsidies and development partners grants.
 - The water revenue increased during the last two financial years rapidly, 61% in FY2022/2023 and 21% in FY2023/2024 respectively. The supply price per m3 continued to increase around 19% for last three years. The sold water volume was increased by 7% from last year. **The increase of tariff accounted for 68% of water revenue increase in the FY2023/2024.**
 - On the cost side, the staff costs account for 28% of expenses. The electricity costs is the second largest cost, accounting for 12%. **The increase of staff cost and electricity costs were the main factor of the increase of cost.**
 - About the balance sheet, borrowings from donors account for the major part, and loans are repaid on time. Capital under construction accounts for the major part of fixed assets, indicating that donor loans are used for capital investment.
- [Note]
- Comparing BS and PL figures from year to year, high inflation rates need to be considered.
 - Addition of sewerage in the scope of business responsibility from October 2023 increased expenditure.
 - There were simple errors such as omission of items in calculation in the financial statements.
 - It should be noted that the sudden EBITDA margin improvement to 41% in FY2023/2024 is caused by onetime exchange gain. Excluding this exchange gain, the EBITDA margin is 25%, indicating slight improvement from 20% in the last financial year

Positive

- Turnover covers operating costs without subsidies.
- The capital investment funded by loans from donors, indicating less reliance on subsidies, so the financial soundness of LWB is high.
- Capital expenditures are funded by operating cash flow, and the company has been successful in borrowing and investing using equity capital as leverage.

Negative

- Turnover have not increased compared to the pace of inflation, cost of sales increases, and rate structure changes.
- The accounts receivable turnover is 115 days, which exceed the fee collection deadline. In addition, more than 70% of customers have exceeded their payment due dates.

Analysis

No.	Category	Analysis
1	Basic information	
	Accounting standards	- Accrual accounting with depreciation has been introduced.
	Comments by auditor	- Auditor states that the three financial tables are in accordance with IFRS. - Auditor listed two key audit matters, namely valuation of property, plant and equipment and valuation of trade receivables.
2	P/L	
	Profitability	- The O&M cost coverage ratio recorded slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. The O&M cost coverage ratio excluding subsidies is 127%, meaning it is relatively less dependent on government subsidies and development partners grants. - It should be noted that the sudden EBITDA margin improvement to 55.3% in FY2023/2024 is caused by onetime exchange gain. Excluding this exchange gain and deferred income, the EBITDA margin is 22.4%, indicating slight improvement from 15.2% in the previous financial year. - The water revenue increased last two financial years rapidly, 61% in FY2022/2023 and 21% in FY2023/2024 respectively. The supply price per m3 continued to increase around 19% for last three years. The sold water volume was increased by 7% from last year. The increase of tariff accounted for 68% of water revenue increase in the FY2023/2024. - Regarding expenses, administrative expenses decreased 4% from the previous year, but cost of sales increased 14%, for a total increase of 8%. - Although the amount of grants and subsidies increased, the impact of the decrease in revenues and the increase in expenses was outweighed, resulting in a 63% decrease in net income compared to the previous year.
	Revenues Composition	- Revenues consist of water sales, meter testing fees, and reconnection fees, with water sales accounting for almost 100% of revenues. - The "Exchange gain unrealised" recorded MK10,598,101 as other income. Without this, the operating income is only 7million MK. - In addition to sales, amortization of DP support for projects and other income are recognized as revenues. The ratio of amortization of deferred income (DP supports) to income has decreased to 4% from 8.9% in FY2020/2021. - LWB took over the sewerage services in October 2023 and the billing started from May 2024. The connection is 8,408 as of March 2024. - The customer category of the sales revenue is consisted by 52% of "Residencial" and 23% of Institutional. However, the sales
	Subsidy details and trends	- The grants and subsidies are recorded as deferred income in B/S, with revenue recorded in the "amortised capital contribution" in PL to be distributed over the project period.
	Expenses Composition	- While the finance costs has been increasing, the interest coverage ratio improved due to the increase of the EBIT. - On the cost side, the staff costs account for 28% of expenses. The electricity costs is the second largest cost, accounting for 12%. The increase of staff cost and electricity costs were the main factor of the increase of cost.
3	B/S	
	Financing	- The equity ratio is on a declining trend, falling below 26% by FY2023/2024. However, the decline in the equity ratio is due to an increase in loans from DPs for rapid capital investments. The amount of equity capital has not changed significantly, and current liabilities are decreasing, so the soundness of the BS is not low. - Deferred income, which is government and donor subsidies, accounts for 15% of total asset. On the other hand, long-term and short term borrowings account for 46% of total assets, indicating the significance of borrowing.

	Fixed Assets	- The Property, Plant and Equipment was increased by 51% to 222 billion. However, the 45% of increase comes from revaluation and the rest comes from purchase. •At March 2024, 61% of fixed assets is "capital work in progress." Assets under construction have increased rapidly since 2020, when the IDA's project began, with project completion scheduled for 2025. - Next to capital work in progress, fixed assets accounted for 13% of Buildings and structures, 8% of the water distribution network. •The accumulated depreciation to historical cost of PPE is as low as 1.7% in FY2023/2024. The revaluation of the fixed asset have been conducted in 2019, December 2023, and planned to be conducted in 2028. According to this revaluation, the amount
	Accounts Receivable	•The accounts receivable turnover is 124 days. The impairment cost is calculated 18% for the accounts receivable which is past due 180 days or more. •The trade receivable which is past due more than 30 days accounts for 44%. This signifies needs to acceleration of collection.
4	C/F	
	Trends	•Operating cash flow is continuously positive. Thus the operating cash inflow and loans support investment expenditure. Cash equivalents continue to increase.

JICA Exchange rate in Oct 2024

1MWK= 0.0827 Yen

1USD= 142.296 Yen

1MWK= 0.00058 USD

GDP pe 672.87 USD

3. Summary of bottleneck analysis

Summary of bottleneck analysis

Bottleneck analysis	
1) High utilization of water production capacity and rising water demand The construction of a new water treatment plant (50,000 m³/day) is currently underway. Once completed, it will increase water production capacity, allowing for an expansion of the customer base and improvement of supply hours. However, this additional capacity will only be sufficient to meet projected water demand until 2027. Currently, the Lilongwe River serves as the primary water source, but there is a plan to supply treated water from Lake Malawi to Lilongwe City. A feasibility study for this project has already been conducted with financing from local banks. Additionally, efforts to secure alternative water sources are progressing, ensuring a continuous increase in water production capacity. While water production capacity will not be a bottleneck, water resources will become increasingly costly as they become scarcer. Therefore, effective water resource management is crucial to ensuring long-term sustainability. 2) Persistently high Non-Revenue Water (NRW) ratio Current NRW status: The total NRW stands at 41%, with 25% attributed to physical losses. Commercial losses stem from water theft, meter under-registration, and unread/unbilled accounts. Aged pipeline infrastructure, particularly asbestos cement (AC) and galvanized iron (GI) pipes, estimated to be over 40 years old, contributes significantly to frequent bursts and leaks. Additionally, exposed pipes in the distribution network further exacerbate leakage issues. Recent NRW reduction efforts: The JICA Technical Cooperation Project aimed at reducing NRW was recently completed, and its effectiveness has been positively evaluated. LWB has a dedicated NRW department, and key interventions, such as DMA zoning and SCADA monitoring, have been implemented. LWB management acknowledges the need for continuous NRW reduction efforts within DMAs, and it is expected that the NRW ratio will gradually decline through initiatives such as the DMA-Level Performance-Based Incentivized NRW Reduction Program, which seeks to expand the successful measures implemented under JICA and World Bank projects to other zones. Challenges & capacity development needs: Despite ongoing efforts, challenges persist in areas such as hydraulic calculations, water pressure management (including regular bulk meter testing), leakage surveys, and GIS applications. Strengthening capacity in these areas will significantly enhance the efficiency and effectiveness of NRW reduction measures. Pipeline renewal progress: So far, 429 km of aging pipelines (including asbestos and other deteriorated pipes) have been replaced, contributing to improved network reliability. The total pipeline network spans 2,634 km, with approximately 400 km still requiring urgent replacement. The planned replacement of these remaining pipelines is essential to further reduce physical losses and enhance system efficiency. 3) Unregulated tariff adjustment and its process The primary driver of the significant financial improvement in FY2023/2024 was the tariff increase implemented in August 2023. However, since 2018, tariff adjustments have only occurred twice—in November 2021 and August 2023. There is no automatic mechanism to adjust tariffs in response to inflation, exchange rate fluctuations, or electricity tariff increases. Any tariff revision requires approval from the Ministry of Water, creating uncertainty in the timing and frequency of adjustments. There is growing concern that future tariff revisions may not keep pace with inflation and other economic conditions beyond 2023, which could weaken financial capacity. Additionally, customer affordability across different segments must be assessed to ensure that tariff adjustments remain feasible while maintaining financial sustainability. 4) Delayed payments by government institutions The accounts receivable turnover is 124 days. The impairment cost is calculated 18% for the accounts receivable which is past due 180 days or more. This signifies a need for acceleration of collection. The on-time bill payment ratio of government institutions is very low, significantly impacting LWB's cash flow, especially under high inflation conditions.	
External factors 5) Unmanaged Watershed for Water Supply Sources Increasing turbidity due to watershed development Deforestation, urbanization, and agricultural expansion in the watershed have led to higher silt inflow, particularly during the rainy season. This has caused a significant increase in turbidity, which was not an issue in the past. Higher turbidity increases treatment complexity and chemical costs, impacting overall efficiency. Sediment accumulation & treatment challenges Tributaries contribute to high turbidity after water is discharged from Kamuzu Dam into the Lilongwe River. While the dam has flushing outlets to release accumulated silt during floods, screen clogging at the intake system of water treatment remains a frequent issue. Increased sediment load may shorten infrastructure (pumps) lifespan and raise operational costs. Need for improved watershed management Without sustainable land and water resource management, the impact of urban expansion and climate variability will further degrade water quality. Strengthening catchment protection, afforestation, and erosion control measures is essential for long-term water security. 6) Macroeconomic challenges, especially the high inflation Malawi has experienced high inflation and currency devaluation, which have adversely impacted financial sustainability. Without tariff adjustments and improvements in operational efficiency, these economic conditions pose significant financial challenges. In addition to that, Malawi government is in tight financial condition and undergoing adjustment and reforms, committed under the Extended Credit Facility (ECF) arrangement with IMF. This might be a reason for the LWB's change of cash management of WB. The government decided for the WBs to deposit its cash to central bank from April 2025. Those tightening financial management might affect the WBs. 7) Need of cooperation with local government LWB intend to expand their service area and need cooperation of local government to find additional areas for water supply.	

List of bottleneck analysis results and recommendations for improvement

No	Issues	Confirm- action required	Diagnostics	Recommendations for improvement	Countermeasure period*2
Internal Factors					
1.	Management and finance				
	Issues with accounting consistency and transparency				
	Low profitability		- The main reason of rapid improvement of financial results in FY2023/2024 was mainly due to the tariff increase in August 2023. From 2018, the adjustment took place only on November 2021 and August 2023 only. There is no mechanism to automatically reflect inflation rate and exchange rate fluctuation. The adjustment needs to be approved by the ministry of water.		
	Challenges in the process of setting tariff		• In the five years from 2018 to 2023, water rates have increased 2.1 times, which may reflect high inflation rates that fluctuate between 10~30%. • The procedure for revising rates is that the LWB prepares a draft based on the Water Law, which is approved by the government, and there is no mechanism to automatically reflect inflation rates. Therefore, it is possible that the rate revision may not keep pace with the rapid rising rate of inflation after 2023. LWB is a government agency, and water tariffs are determined by the government. However, tariff decisions are not solely based on cost considerations; other factors, such as social benefits and affordability, are also taken into account. Internally, LWB has a tariff model for budget management purposes. Currently, tariffs are set based on cost recovery, but there is no system to automatically adjust tariffs in line with inflation. Establishing a formal application process or guidelines is necessary. The Ministry of Water serves both as a shareholder and a regulator, making it essential to engage in discussions with the ministry regarding tariff adjustments. LWB has an internal tariff management model, but the lack of a standardized model for water tariff calculations remains a challenge.		
	Lack of investment capital				
2.	Service provision and maintenance				

No	Issues	Confirm- action required	Diagnostics	Recommendations for improvement	Countermeasure period*2
	The water supply coverage ratio and the population served are not growing.		The water demand (approx.135,000m³/day) by far exceeds the available water treatment capacity (125,000m³/day). However, the development of wells and new water treatment plant are being constructed. After those construction completed, water supply hours would improve.	-	
	Insufficient infrastructure development				
	High non-revenue water (NRW) rate		The NRW ratio is high at 40%. The JICA project has been implemented and are judged to be effective. Management of LWB also understands the importance and the need for patience in reducing NRW. The NRW ratio is expected to gradually decrease, but areas for improvement have also been identified for the implementation of NRW measures in the JICA project. In order to accelerate the reduction of NRW, these areas for improvement should be strengthened with the support of donors. The Implementation of the DMA-Level Performance-Based Incentivized NRW Reduction Program aims to expand the initiatives supported by JICA and the World Bank projects to other zones. Commercial losses are composed of water theft, meter under registrations and unread/unbilled accounts. there is high occurrence of bursts and leaks due to an aged pipe infrastructure especially AC and GI Pipes which is estimated to be over 40 years old. Exposed pipes in the distribution network is also contributing to the high occurrence of leaks and bursts.*1 It is necessary to replace aged pipes for NRW measures, especially asbestos pipes. Key Takeaways & Next Steps Strengthening and expanding DMA management for all 109 DMA is essential for NRW reduction. Prioritization of high-impact DMAs will accelerate NRW reduction. Control function is required in SCADA. Pipeline renewal and water pressure optimization should continue to improve efficiency.	-Need support to strengthen these areas of improvement for CPs. -Replacement of aging pipes	Short
	High leakage rate	☑	Surface leakages were detected in the JICA project and re-confirmed the importance of regular patrol for the early detection of surface leakages. On average, 1,176 pipe burst on the major transmission and distribution mains of diameters 63-600mm are repaired annually and approximately 7,400 leaks are repaired annually on pipes of diameters between 15mm and 50mm. A total of 429 km of water pipeline renewal (asbestos and aging pipes) has been completed. The total pipeline network extends 2,634 km, with approximately 400 km still requiring renewal.	ditto	
	Insufficient maintenance of facilities	☑			
	Water outage and unstable supply				
	No DX utilization and low operational efficiency		The SCADA components have been implemented; however, control functionality is not yet in place.		
3.	Commercial Operations				
	Low customer satisfaction		The significant improvement in customer satisfaction since 2016 was achieved through the implementation of the Turnaround Strategy, which involved increasing investments to renew water pipelines, expanding customer service centers, and other initiatives.		
	Low collection rate		While collection rate of private customers is almost 100%, that of governmental institutions is only 23%. Uncollected amount to total billed amount is 13% in the first half year from April 2024 to September 2024.		
4.	Organization and Human Resource Management				
	Shortage of engineers and skills gap	☑	Need to check		
	Reducing organizational efficiency	☑	Need to check		
	Lack of strategic management capabilities in the organization	☑	Need to check		
	Lack of planning	☑	Need to check		
	Governance issues		Between the ministry and the LWB, LWB signed a shareholders letter of expectations on performance targets		
External factors					
5.	Environment (Water Sources)				
	Depletion of water sources and deterioration of water quality		The water source in Lilongwe City is currently dependent on the Lilongwe River. Well development is progressing, and there is a plan to supply treated water from Lake Malawi to Lilongwe City with financing from the local banks. Since efforts to secure alternative water sources are also progressing, this is not considered a major issue. Refer to "The water supply coverage ratio and the population served are not growing." There are two dams along the 28 km stretch of the Lilongwe River, where sediment settles in Kamuzu Dam, resulting in clearer water. After discharge into the Lilongwe River, tributaries join, contributing to increased turbidity. Development, urbanization, deforestation, and agriculture in the watershed cause significant silt inflow from tributaries into the Lilongwe River during the rainy season. The dam has flushing outlets that prevent silt accumulation by releasing it during floods. The water treatment plant's intake system includes screens and sedimentation tanks, reducing the risk of pump damage. However, screen clogging is a frequent issue. High turbidity caused by silt was not an issue before, but due to increased development in the river watershed, turbidity levels have significantly risen.		
6.	Government systems and politics				
	Hindering self-sustaining operations				
	Challenges in Water Supply Policy				
7.	Development Partner Support				
	Lack of development partner support	☑	LILONGWE WATER AND SANITATION PROJECT (LWSP) (WB) (Closing date: June 30, 2025) The project scope consists of four components that contribute to the PDO: (i) Component 1 – Network Rehabilitation, Expansion and NRW Reduction. As of the fiscal year ending March 2024, 61% of fixed assets are recorded as construction in progress. This primarily relates to sewerage development and other improvements supported by the World Bank.		
8.	Socioeconomic Finance				
	Socioeconomic Impact		The inflation rate 34% in 2023 and 21.9% in 2024. The local currency was depreciated rapidly by 50% from 2022 to 2023.		
	Lack of financial resources		The minimum lending rate by the Reserve Bank of Malawi is 24.9%.		

3. Summary of bottleneck analysis

Summary of bottleneck analysis

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	Lack of investment capital				
2.	Service provision and maintenance				
	The water supply coverage ratio and the population served are not growing.		The water demand (approx. 135,000m ³ /day) by far exceeds the available water treatment capacity (125,000m ³ /day). However, the development of wells and new water treatment plant are being constructed. After those construction completed, water supply hours would improve.	-	
	Insufficient infrastructure development				

No	Issues	Confirm- action required	Diagnostics	Recommendations for improvement	Countermeasure period*2
	High non-revenue water (NRW) rate		The NRW ratio is high at 40%. The JICA project has been implemented and are judged to be effective. Management of LWB also understands the importance and the need for patience in reducing NRW. The NRW ratio is expected to gradually decrease, but areas for improvement have also been identified for the implementation of NRW measures in the JICA project. In order to accelerate the reduction of NRW, these areas for improvement should be strengthened with the support of donors. The Implementation of the DMA-Level Performance-Based Incentivized NRW Reduction Program aims to expand the initiatives supported by JICA and the World Bank projects to other zones. Commercial losses are composed of water theft, meter under registrations and unread/unbilled accounts. there is high occurrence of bursts and leaks due to an aged pipe infrastructure especially AC and GI Pipes which is estimated to be over 40 years old. Exposed pipes in the distribution network is also contributing to the high occurrence of leaks and bursts.*1 It is necessary to replace aged pipes for NRW measures, especially asbestos pipes. Key Takeaways & Next Steps Strengthening and expanding DMA management for all 109 DMA is essential for NRW reduction. Prioritization of high-impact DMAs will accelerate NRW reduction. Control function is required in SCADA. Pipeline renewal and water pressure optimization should continue to improve efficiency.	-Need support to strengthen these areas of improvement for CPs. - Replacement of aging pipes	Short

Nc	Issues	Confirm- action required	Diagnostics	Recommendations for improvement	Countermeasure period*2
	High leakage rate	☑	Surface leakages were detected in the JICA project and re-confirmed the importance of regular patrol for the early detection of surface leakages. On average, 1,176 pipe burst on the major transmission and distribution mains of diameters 63-600mm are repaired annually and approximately 7,400 leaks are repaired annually on pipes of diameters between 15mm and 50mm. A total of 429 km of water pipeline renewal (asbestos and aging pipes) has been completed. The total pipeline network extends 2,634 km, with approximately 400 km still requiring renewal.	ditto	
	Insufficient maintenance of facilities	☑			
	Water outage and unstable supply				
	No DX utilization and low operational efficiency		The SCADA components have been implemented; however, control functionality is not yet in place.		
3.	Commercial Operations				
	Low customer satisfaction		The significant improvement in customer satisfaction since 2016 was achieved through the implementation of the Turnaround Strategy, which involved increasing investments to renew water pipelines, expanding customer service centers, and other initiatives.		
	Low collection rate		While collection rate of private customers is almost 100%, that of governmental institutions is only 23%. Uncollected amount to total billed amount is 13% in the first half year from April 2024 to September 2024.		
4.	Organization and Human Resource Management				
	Shortage of engineers and skills gap	☑	Need to check		
	Reducing organizational efficiency	☑	Need to check		
	Lack of strategic management capabilities in the organization	☑	Need to check		
	Lack of planning	☑	Need to check		
	Governance issues		Between the ministry and the LWB, LWB signed a shareholders letter of expectations on performance targets		
			External factors		
5.	Environment (Water Sources)				
	Depletion of water sources and deterioration of water quality		The water source in Lilongwe City is currently dependent on the Lilongwe River. Well development is progressing, and there is a plan to supply treated water from Lake Malawi to Lilongwe City with financing from the local banks. Since efforts to secure alternative water sources are also progressing, this is not considered a major issue. Refer to "The water supply coverage ratio and the population served are not growing." There are two dams along the 28 km stretch of the Lilongwe River, where sediment settles in Kamuzu Dam, resulting in clearer water. After discharge into the Lilongwe River, tributaries join, contributing to increased turbidity. Development, urbanization, deforestation, and agriculture in the watershed cause significant silt inflow from tributaries into the Lilongwe River during the rainy season. The dam has flushing outlets that prevent silt accumulation by releasing it during floods. The water treatment plant's intake system includes screens and sedimentation tanks, reducing the risk of pump damage. However, screen clogging is a frequent issue. High turbidity caused by silt was not an issue before, but due to increased development in the river watershed, turbidity levels have significantly risen.		
6.	Government systems and politics				
	Hindering self-sustaining operations				
	Challenges in Water Supply Policy				
7.	Development Partner Support				
	Lack of development partner support	☑	LILONGWE WATER AND SANITATION PROJECT (LWSP) (WB) (Closing date: June 30, 2025) The project scope consists of four components that contribute to the PDO: (i) Component 1 – Network Rehabilitation, Expansion and NRW Reduction. As of the fiscal year ending March 2024, 61% of fixed assets are recorded as construction in progress. This primarily relates to sewerage development and other improvements supported by the World Bank.		
8.	Socioeconomic Finance				
	Socioeconomic Impact		The inflation rate 34% in 2023 and 21.9% in 2024. The local currency was depreciated rapidly by 50% from 2022 to 2023.		
	Lack of financial resources		The minimum lending rate by the Reserve Bank of Malawi is 24.9%.		

4. Diagnostics based on Growth Spiral (GS diag)

Overall diagnostics of growth spiral

The four spiral components are working or working well in FY2023/24. While the LWB is on growth spiral, the 68% of increase of water revenue was composed by tariff hike in the FY2023/2024. In addition, the O&M cost coverage ratio only recorded slight improvement from 131% in FY2020/2021 to 134% in FY2023/2024. This suggests the needs of improvement of efficiency.

Thus, the followings are concern for all spirals to continuously work well in near future.

- The progress of capital investment for increase production capacity given the high utilization ratio of water production capacity.
- Operation efficiency improvement including measure against high NRW ratio.
- The possibility of regular tariff adjustments, given the over 20% inflation rate.

Growth spiral diagnostics

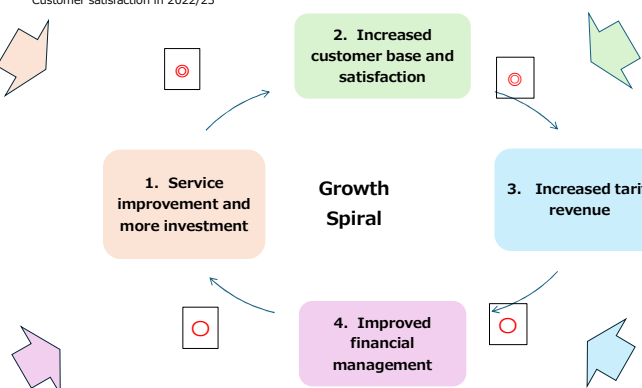
(1→2) Is the service improvement leading to an increase in the number of customers?	
Diagnosis result	The production volume is increasing although the production capacity is not increasing. The construction of a new water treatment plant (50,000 m ³ /day) is currently underway. After the completion, production will increase and population served and service coverage would further increase. The quality of water supplied and customer satisfaction are very good. The trend of service coverage is positive, except service hours. The spiral is working well.

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
9	Population served	1,120,085	-	↗	
10	Service coverage / Water coverage (%)	95.0	4	↗	
11	Customer satisfaction (%)	76	2	↗	
12	Water sold (m ³ /day)	66,394	-	↗	
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	59.3	-	→	

Customer satisfaction in 2022/23

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?	
Diagnosis result	All indicators in 2 are in increasing trend. As a result, the turnover is in increasing trend except in 2021, which might be due to Covid-19 impact. The spiral is working well.

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
1	Investment cost (Currency)	42,632,508	-	↗	
2	Production capacity (m ³ /day)	125,000	-	→	
3	Production (m ³ /day)	112,383	-	↗	
4	Utilization ratio of production capacity (%)	90	-	↗	
5	Continuity of Service (Hrs/day)	22	2	→	2
6	Quality of water supplied (Compliance rate: %)	97	4	→	
7	Water supply pressure	3	-	-	
8	Leakage ratio (%)	25	-	→	



KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
14	Turnover from sales	37,959,605	-	↗	
15	Collection ratio (%)	95	3	↗	
16	Non-revenue water ratio(%)	40.9	1	→	1
17	Metering ratio (%)	100	4	→	
18	Water tariff level (USD/6m ³)	3	-	-	

(4→1) Is the financial improvement leading to investment activities?	
Diagnosis result	The majority of capital investments have been funded by DPs' loan and grants. The capital investments caused a rapid increase in work in progress after 2020. The majority seems to be the treatment plant especially funded by the World bank, which will be completed in June 2025. This completion is expected to increase the water production and improve water supply service. The spiral is working, but needs to complete new water treatment plant.

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
19	Accounting system	IFRS	3	→	
20	Net income (Currency)	33,691,431	-	↗	
21	EBITDA (Currency)	20,975,869	-	↗	
22	EBITDA margin (%)	55.3	3	↗	
23	EBITDA margin excluding deferred income (%)	50.3	3	↗	
24	Total capital operating margin (%)	3.2	-	↗	
25	Operating Profit Margin(%)	39.2	3	↗	
26	Equity ratio (%)	26.0	2	↗	
27	Fixed long term conformity rate (%)	81.1	3	↗	
28	O&M cost coverage ratio (%)	133.7	3	↗	USD
29	O&M cost coverage ratio excluding subsidies (%)	127.4	2	↗	
30	Unit cost of water supply (Currency/m ³) (Overall cost including DFP/Water sold)	1,498.0	-	→	0.86
31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	1,566.4	-	↗	0.90
32	Subsidies (Currency)	0	-	→	
33	Development Partner grant support (Currency)	1,611,248	-	↗	
34	The ratio of subsidies and DP support to turnover (%)	4.2	-	→	
35	Number of staff per 1,000 connections	5	3	→	

1MK= 0.000577 USD

(3→4) Is the tariff revenue improvement leading to financial improvement?	
Diagnosis result	Almost all financial indicators have been improved especially in 2023/24. Increased turnover has lead to increase of EBITDA margin excluding deferred income. However, the NRW ratios has been high, which hinders profitability. Debt service coverage ratio was improved significantly from 0.06 to 3.40 FY2020/2021 in FY2023/2024. The number of staff per 1,000 connections shows higher human resource efficiency. - It should be noted that the sudden EBITDA margin improvement to 55.3% in FY2023/2024 is caused by onetime exchange gain. Excluding this exchange gain and deferred income, the EBITDA margin is 22.4%, indicating slight improvement from 15.2% in the previous financial year. The spiral is working but need to improve NRW.

Legend

- Working well
- Working
- △ Not working well

5. Strategy analysis

Medium- to long-term direction of the water utility

1. Our Vision

"To be a leading, **customer-focused, financially viable** water and sanitation utility in Africa"

2. Our Mission

"Provide **sufficient water** supply and safely managed sanitation services in a sustainable, efficient, and customer-responsive manner"

3. Our Core Values

➤ Customer focus, Integrity, Collaboration, Team work, Inclusiveness, Innovation

4. Our Motto

"Potable water all the time for all"

5. Malawi's National Water Policy (revised in 2023)

The policy priority area 2 of water supply and waterborne sanitation indicates the effective and efficient water supply management through the **reduction of NRW** in all supply areas of all the water boards in the country at most to **25%**. Further, **developing and building the capacity** of personnel in water utilities through formal and information trainings is set as priority.

6. First 10-Year Implementation Plan (MIP-1, 2021-2030)

MIP-1 aims to reach **100 percent coverage** by 2030 from 88.2 percent in 2020.

7. Water Safety Plan in July 2021

LWB developed its Water Safety Plan in July 2021 in alignment with the 2020-2025 Strategic Plan. The Plan aims to address major risks in water safety during the period from 2021 to 2025. Water Safety Plans are an effective tool to protect and ensure water quality and supply to the communities of Lilongwe City and surrounding areas. *Annual Report 2022

8. The 2020-2025 Strategic plan (The six strategic focus areas)

- (1) Reliability of Water Supply
- (2) Non-Revenue Water reduction
- (3) Customer Satisfaction
- (4) Financial Capacity for infrastructure development
- (5) Institutional and Human Capacity Development
- (6) Wastewater Management

Note: The new strategic plan from June 2025 is planned to adopt circular economy approach in the management of the sewer services.

Suggestions for improvement

Overall Goal:

"To be a leading, customer-focused, financially viable water and sanitation utility"

This goal aligns with LWB's commitment to customer-focused practices, enhancing financial viability, and maintaining the highest standards of integrity and collaboration and Malawi's National Water Policy (revised in 2023) to achieve less than 25% of NRW ratio, which will maintain financial viability.

- **LWB is a leading utility in Malawi and should take the lead in supporting other utilities in the country to advance and develop the water supply sector. This effort will position LWB as a leading utility not only in Malawi but also across Africa.**

Mid-Term Goal:

"Water supply reliability along with financial sustainability is further enhanced"

Key Strategies for Sustainable Growth

Sustaining High Financial Performance for Long-Term Growth

To ensure the growth spiral functions effectively in the long term, LWB must maintain strong financial performance.

A greater focus on operational efficiency, including NRW reduction and timely tariff adjustments that consider affordability, is essential.

Strengthening NRW Reduction Efforts

The dedicated NRW team and DMA management, along with the outcomes of the JICA technical cooperation project, will enable sustained and effective NRW reduction, leading to a steady decline in NRW levels. Addressing remaining challenges, such as replacing aging asbestos pipes, improving hydraulic calculations, managing water pressure, conducting leakage surveys, and leveraging GIS, will further enhance NRW management efforts.

Timely and Affordable Tariff Adjustments

Tariff adjustments should be timely and aligned with inflation and currency devaluation, while ensuring affordability for all customer segments.

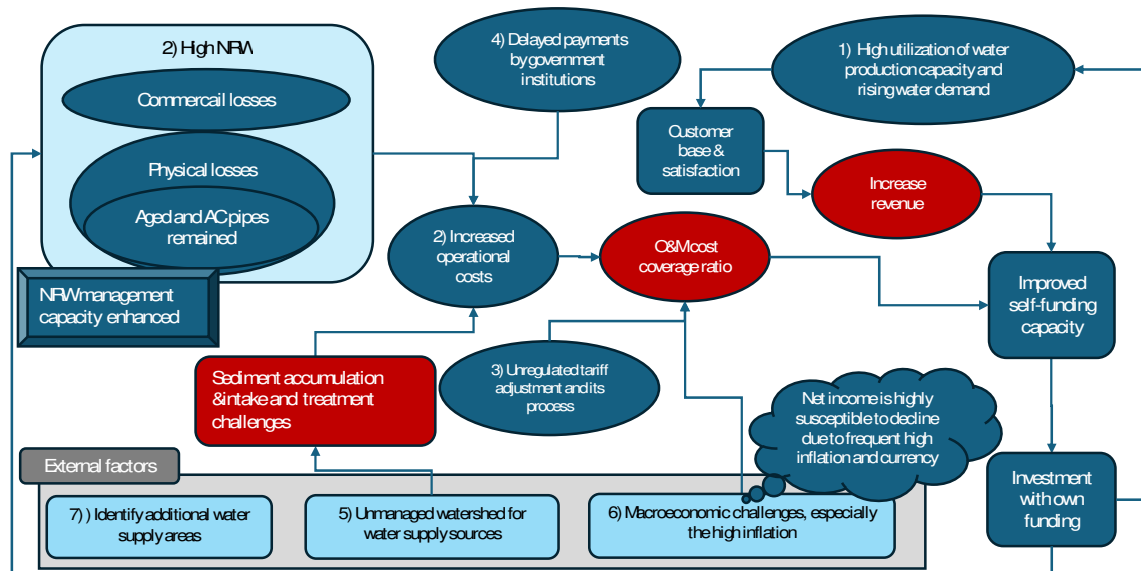
Expanding Water Supply Capacity for Sustainable Growth

Current efforts to increase water production capacity will help achieve 100% coverage and extend water supply service hours, reinforcing the sustainable growth spiral.

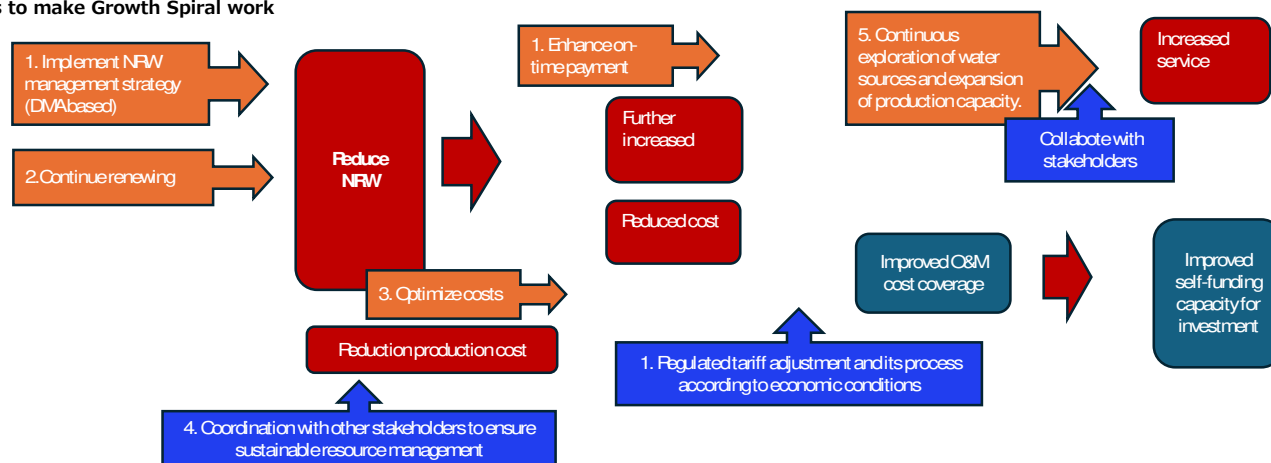
Addressing External Challenges

Unmanaged watershed degradation affecting water supply sources requires coordination with other stakeholders to ensure sustainable resource management. ~~High inflation and currency devaluation must be closely managed to mitigate financial risks~~

Current Spiral:



Steps to make Growth Spiral work

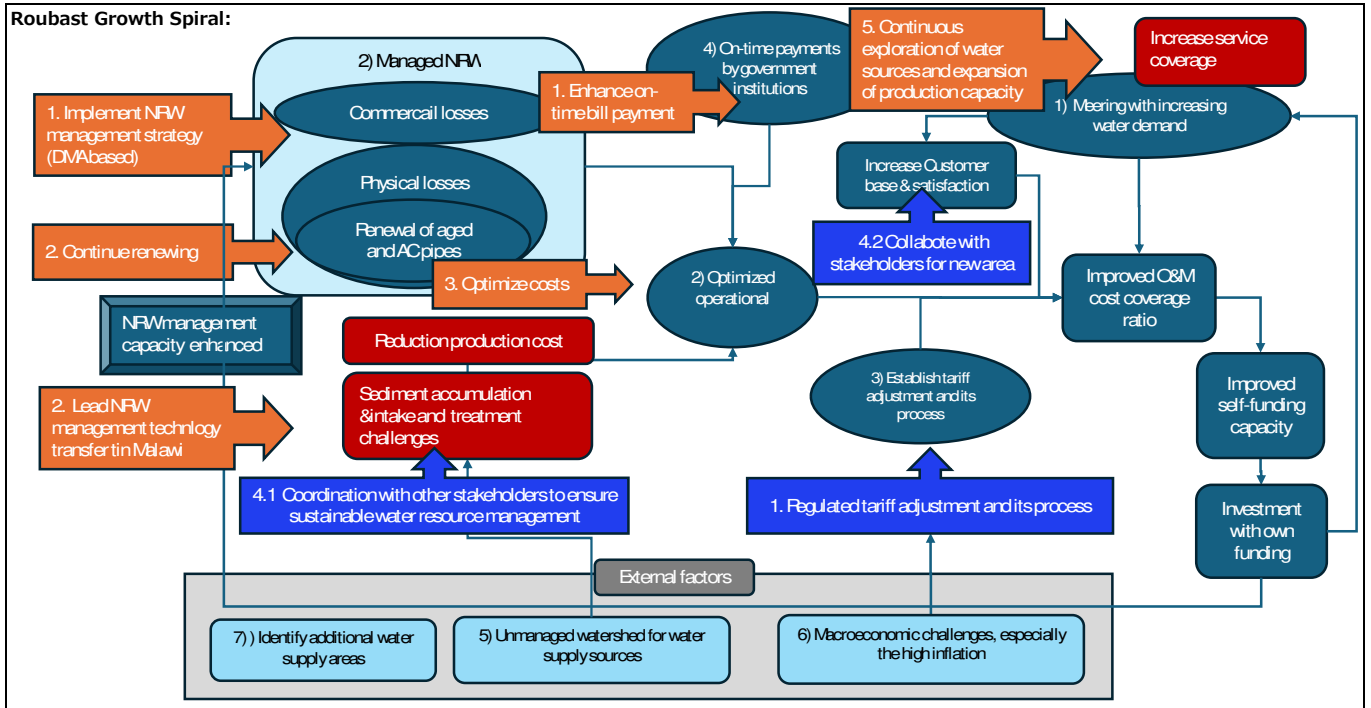


Steps for Roubast Growth Spiral:

1. Implement NRW management strategy (DMA based)
1. Enhance on-time bill payment
1. Regulated tariff adjustment and its process according to economic conditions (External factor)
2. Continue renewing aged and AC pipes
3. Optimize costs including reduction production/treatment cost
4. Coordination with other stakeholders (External factor)
- 4.1 to ensure sustainable water resource management
- 4.2 to find additional water supply areas
5. Continuous exploration of water sources and expansion of production capacity

Lead NRW management technology transfer tin Malawi

Roubast Growth Spiral:



6. Potential Solutions

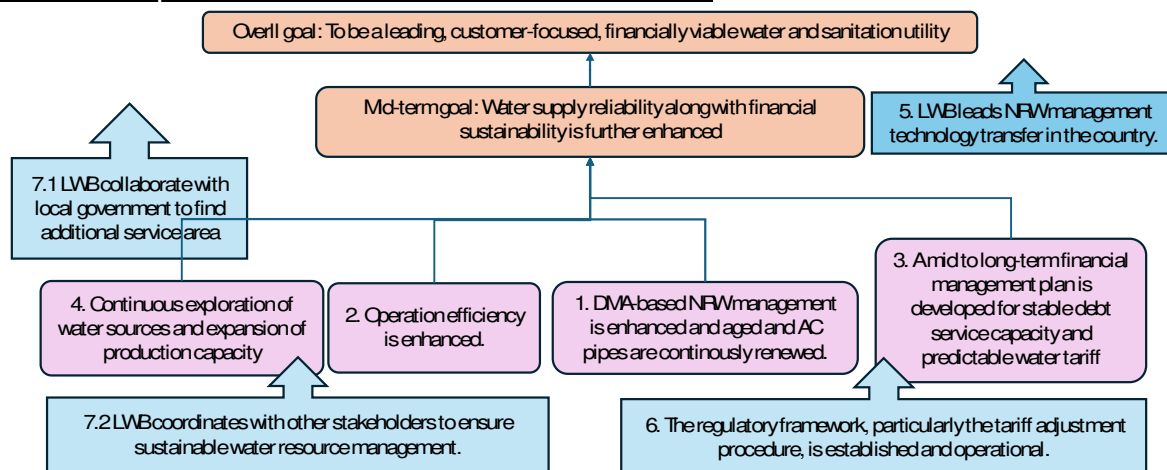
Goals	
Overall Goal	To be a leading, customer-focused, financially viable water and sanitation utility
Mid-term Goal	Water supply reliability along with financial sustainability is further enhanced

Outcomes					
	Outcomes	Indicator	Base line	Target 2030	Long term
1	DMA-based NRW management is enhanced and aged and AC pipes are continuously renewed.	NRW (%)	40	30	20
2	Operation efficiency is enhanced.	Accounts receivable turnover (days), Operational cost per m3 sold water	124		30
3	A mid to long-term financial management plan is developed for stable debt service capacity and predictable water tariff	Development of financial management plan			
4	Continuous exploration of water sources and expansion of production capacity				
Action to achieve overall goal					
5	LWB leads NRW management technology transfer in the country.				
External actions					
6	The regulatory framework, particularly the tariff adjustment procedure, is established and operational.				
7	LWB coordinates with other stakeholders to ensure sustainable water resource management.				
8	LWB collaborate with local government to find additional service area				

Activities											
		DPs support	Target	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	Long term	
1	DMA-based NRW management is enhanced and aged and AC pipes are continuously renewed.										
	1 NRW DMA-based managemet plan to extend to all DMAs is prepared and implemented based on JICA TC project results.	On-going by LWB	Medium								
	2 Establish asset management system with GIS		Short								
	3 Formulate a replacement plan for distribution network and implement with priority	Partially renewed by WB	Long								
	4 Improve SCADA for control function		Medium								
2	Operation efficiency is enhanced.										
	1 Optimize bill collection (Account recievable turnover).		Short								
	2 Optimize costs		Short								
3	A mid to long-term financial management plan is developed for stable debt service capacity and predictable water tariff										
	1 Strengthen monitoring of performance to analyse the reasons and actions to be taken for improvement during the financial year.		Short								
	2 Seek for a timely tariff adjustment, reflecting inflation, exchange rate fluctuation, including operating cost of new facility in LWB		Short								
	3 Implement affordability analysis for tariff revision and consider adequate tariff structure		Short								
	4 Formulate a long-term financial management plan including prioritizing capital investments, improvement of collection rate, and assuring debt service		Medium								
4	Continuous exploration of water sources and expansion of production capacity										
	1 Explore cost optimized alternative water sources		Long								
	2 Make a plan of water demand management & conservation		Long								
Action to achieve overall goal by LWB											
4	LWB leads NRW management technology transfer in the country.										
	1 Disseminate knowledge and experience including NRW management to other utilities (Seminar. Lecture, etc)		Medium								
	2 OJT in LWB DMA sites		Medium								

External actions											
5	The regulatory framework, particularly the tariff adjustment procedure, is established and operational.										
	1 Establish an independent regulator, whose function includes tariff adjustment	Regulator study for Ministry by WB	Medium								
	2 (The regulator to be established) to develop standard model of tariff adjustment		Short								
	3 (The regulator to be established) Implement regular tariff adjustment										
6	LWB coordinates with other stakeholders to ensure sustainable water resource management.										
	1 Strengthen regulatory measures to control deforestation, urban sprawl, and unregulated farming to preserve water resource areas for water supply		Medium								
	2 Enhance community engagement & awareness to protect water sources		Medium								
	3 Develop climate resilience strategies to mitigate future risks from extreme weather patterns (flood and drought) and cyclone		Medium								
	4 Implement reforestation and afforestation programs to reduce soil erosion.		Medium								
7	LWB collaborate with local government to find additional service area										
	1 Collaborate with local government to find additional service area		Medium								

Scenario of Improvement

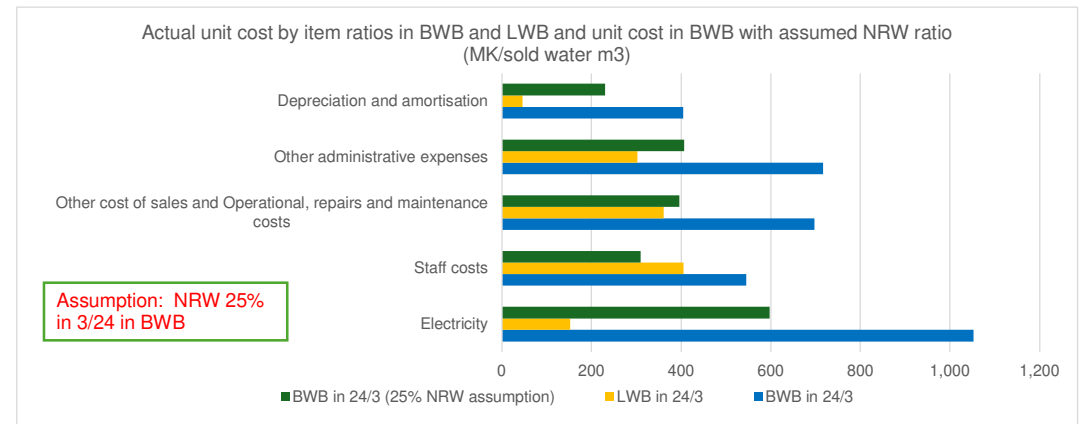
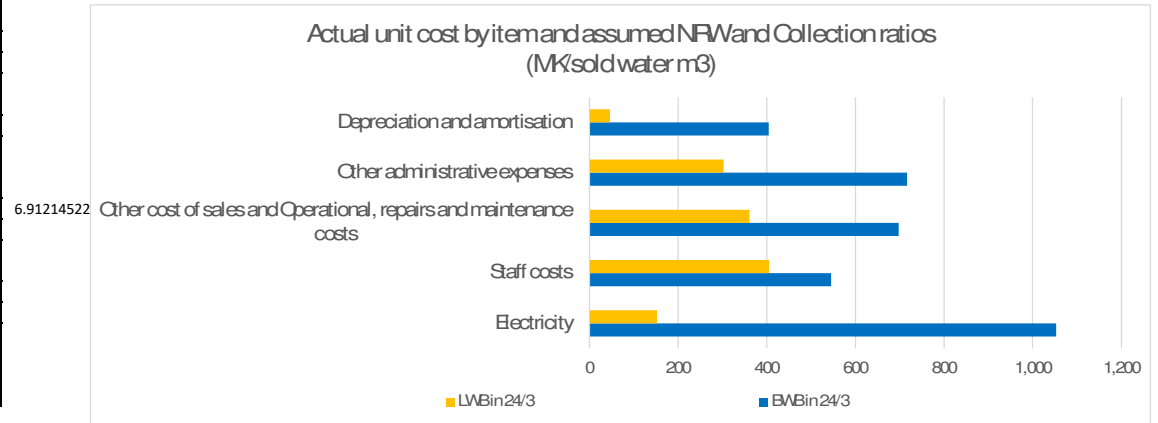
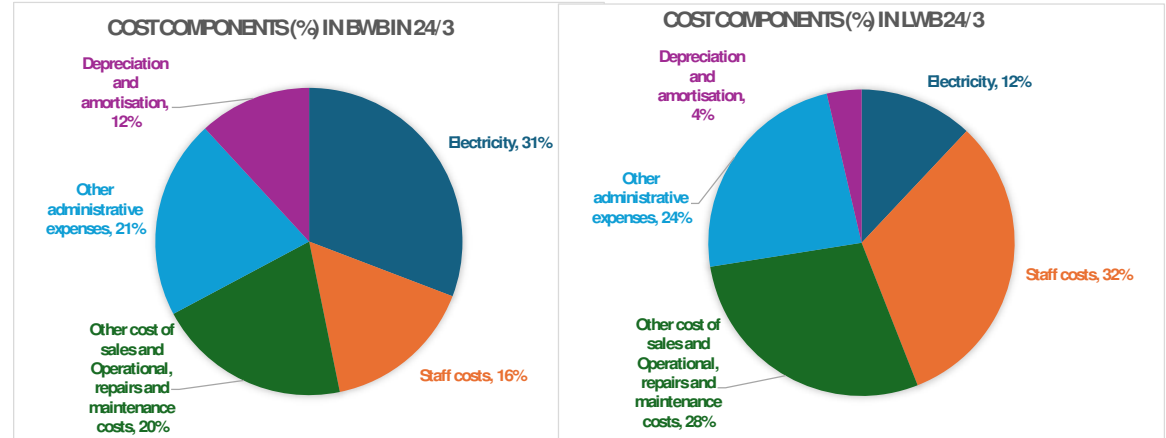


7. Preliminary Financial Comparison between LWB and BWB

	Item	Actual in BWB in 24/3	Actual in LWB in 24/3	Assumption: NRW 25%
KPIs		BWB in 24/3	LWB in 24/3	BWB in 24/3
	Production (m3/annual)	33,366,384	41,019,795	33,366,384
	Sold water (m3/annual)	14,209,659	24,413,797	25,024,788
	NRW ratio (%)	55	40	25
	Collection ratio (%)	49	95	
	Unit cost per m3 (Costs/sold water volume)	3,417	1,267	1,940
	Unit price per m3 (Revenue/sold water volume)	2,123	1,555	2,123
	Connections *1	71,974	134,338	
	Investment expenditure	6,096,597	42,632,508	
	Price of 6 M3 (local currency)	10,610	4,391	
	Staff number	625	635	
Revenue and costs (MK'000)		BWB in 24/3	LWB in 24/3	
	Revenue	30,160,723	37,959,605	53,116,384
	Costs (excl. finance cost and exchange loss)	(48,550,546)	(30,926,388)	(48,550,546)
	Electricity	(14,958,952)	(3,718,262)	(14,958,952)
	Staff costs	(7,750,195)	(9,891,626)	(7,750,195)
	Other cost of sales and Operational, repairs and maintenance costs *2	(9,911,495)	(8,809,435)	(9,911,495)
	Other administrative expenses *2	(10,179,683)	(7,380,334)	(10,179,683)
	Depreciation and amortisation	(5,750,221)	(1,126,731)	(5,750,221)
Cost components (%)		BWB in 24/3	LWB in 24/3	
	Electricity	31%	12%	
	Staff costs	16%	32%	
	Other cost of sales and Operational, repairs and maintenance costs	20%	28%	
	Other administrative expenses	21%	24%	
	Depreciation and amortisation	12%	4%	
Unit cost (MK/sold water m3) by item		BWB in 24/3	LWB in 24/3	BWB in 24/3 (25% NRW assumption)
	Electricity	1,053	152	598
	Staff costs	545	405	310
	Other cost of sales and Operational, repairs and maintenance costs	698	361	396
	Other administrative expenses	716	302	407
	Depreciation and amortisation	405	46	230
	Total	3,417	1,267	1,940
	Staff cost per connection	108	74	
	Staff cost per person per month	1,033	1,298	
	Investment per connection	85	317	

Note: *1 BWB is 2023, LWB is 2024.

Note: *2 These cost items are sorted and aggregated by JICA team as the both utilities are not same cost items in P/L statement.



0. Benchmark

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Invetsment cost (Currency)	—	—	—	—
		2	Production capacity (m³/day)	—	—	—	—
		3	Production (m³/day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m³/day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover from sales				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%	15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6m3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Aim for Public Company Accounting	—
Profitability		20	Net income (Currency)	—	—	—	—
		21	EBITDA (Currency)	—	—	—	—
		22	EBITDA margin (%)	Negative	0%-40%	Aim for 40% or more	—
		23	EBITDA margin excluding deferred income (%)	Negative	0%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
		25	Operating Profit Margin(%)	—	8% or less	Aim for 10% or more	—
Financial soundness		26	Equity ratio (%)	—	30% or less	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency/m³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (Currency)	—	—	—	—
Human resource efficiency		33	Development Partner grant support (Currency)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover (%)	—	—	—	—
		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Les than 4.0

3a. Bottleneck analysis (details)

Boundary	No.	Checklist	Problem		Describe the specific problem
			No	Yes	
Internal Factors	1	Management and finance			
		Accounting consistency and transparency issues			
		Financial statements are made not on the accrual basis of accounting.	☒	☐	
		There is no fixed assets register for financial management	☒	☐	
		Low profitability			
		The water revenue is insufficient to recover O&M costs.	☒	☐	
		The water revenue is insufficient for full-cost recovery including investment cost	☒	☐	
		Unit price of water supply is low	☐	☐	
		Unit cost of water supply is high	☐	☐	
		Process for setting water tariff is not in place			
		Water tariff is not reviewed on a regular basis	☐	☒	According to information available, water rates were revised in 2018, 2021, 2023, and 2024. However, there is no specific regular revision schedule. LWB is a government agency, and water tariffs are determined by the government. However, tariff decisions are not solely based on cost considerations; other factors, such as social benefits and affordability, are also taken into account. Internally, LWB has a tariff model for budget management purposes. Currently, tariffs are set based on cost recovery, but there is no system to automatically adjust tariffs in line with inflation. Establishing a formal application process or guidelines is necessary. The Ministry of Water serves both as a shareholder and a regulator, making it essential to engage in discussions with the ministry regarding tariff adjustments.
		Water tariff is not revised in response to increases in operating costs such as inflation	☒	☒	- In the five years from 2018 to 2023, water rates have increased 2.1 times, which may reflect high inflation rates that fluctuate between 10~30%. - The procedure for revising rates is that the LWB prepares a draft based on the Water Law, which is approved by the Ministry of Water. There is neither mechanism to automatically reflect inflation rates nor specification on regularity of the revision. Therefore, it is possible that the rate revision may not keep pace with the rapid rising rate of inflation after 2023. Water tariff calculations take into account operating costs, loan principal and interest repayments, project investments, and production volume. In 2023, a water tariff revision was implemented. Before this, a survey was conducted to assess residents' payment capacity. However, social and economic conditions changed between the survey period and the actual implementation of the new tariffs, affecting the initial assumptions. LWB has an internal tariff management model, but the lack of a standardized model for water tariff calculations remains a challenge.
		Insufficient planning and investment funding shortage			
		No business operation plan and facility development plan have been prepared.	☒	☐	
		No financial projection of short to long term funds	☒	☐	
		High reliance on external funding such as subsidies in multi-year business plans	☒	☐	

Boundary	No.	Checklist	Problem		Describe the specific problem
			No	Yes	
	2	Service provision and maintenance issues			
	The water supply coverage ratio and the population served are not growing.				
		The water supply coverage ratio and the population served are not growing.	☒	☐	
	Insufficient infrastructure development				
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☐	☒	Malawi's capital city Lilongwe has a growing population, with annual growth rate of 3.8 % (2018 census) which is higher than the national average of 2.9%. As a result, the water demand (approx.135,000m³/day) by far exceeds the available water treatment capacity (125,000m³/day).*1 WB and EIB are supporting developments of new facilities. See donor support.
		Development of new facilities is not progressing	☒	☐	
		There is a lot of aging infrastructure	☐	☒	LWB has still many old asbestos cement (AC) pipes in the distribution network. When AC pipes are needed to be cut or removed for repairing leaks, special attention should be paid to prevent asbestos dust dispersing to protect the health of on-site workers. Furthermore, pipe connection and repair work require the compliance to standard procedures to secure the quality of work. However, there were observed cases that standards procedures were not fully complied with due to the lack of proper tools/materials or unconcerned about the compliance by the workers, which may cause new or frequent leakages in near future.*1
	High non-revenue water (NRW) rate				
		Water balance not calculated	☒	☒	The evaluation team recommends that each zone to maintain the accuracy of bulk meters readings through conducting regular meter testing and readings. *1 Under the JICA Technical Cooperation Project, DMA management has been introduced in the South district. Moving forward, it is essential to expand NRW management through DMA, utilizing the equipment provided by JICA. The experience from the South district will be applied to other areas, considering efficiency and effectiveness. Further support for DMA management is also necessary. Through the World Bank project, 109 DMAs have been established and are being monitored. As part of asset management, a pipeline register has been created. Currently, only installation years are recorded, but this helps identify sections that need replacement. Water pressure management has been strengthened. The maximum water pressure, which was previously 100m, has now been reduced to 70m. DMA will be utilized to further optimize water pressure. Physical losses are estimated to be 63%. The benefits of NRW reduction are also being calculated. The SCADA system is not fully functional, as it is limited to monitoring without control capabilities. The installation of control equipment is expected to be supported by development partners (DPs). SCADA was completed in May 2023 with support from the EIB, while DMA development was funded by the World Bank. The system consists of three hierarchical levels: water treatment to reservoirs, three zones, and 109 DMAs. One of the challenges in DMA management is the need to align water volume and the billing cycle. Additionally, some DMAs are not yet fully separated. Currently, 80% of the DMA system is complete, but there are cases where certain DMAs show negative NRW values. Management efforts are being prioritized in areas where DMA has been fully implemented. Nighttime minimum flow monitoring is also being conducted, with higher values indicating significant leakage. DMAs with major issues and those contributing the most to NRW are being evaluated, prioritized, and addressed accordingly. <u>SCADA monitoring operates in two shifts, ensuring 24-hour surveillance.</u>
		High commercial loss	☐	☒	Illegal water connections continued to be a major challenge in the efforts to reduce NRW. *3 Annual Report 2021/2022 The Implementation of the DMA-Level Performance-Based Incentivized NRW Reduction Program aims to expand the initiatives supported by JICA and the World Bank projects to other zones. It is planned to be carried out using internal personnel. While DMA implementation has been completed, further improvements in management are necessary.
		There is no specialized department for managing non-revenue water.	☒	☐	
		There is no plan to reduce non-revenue water, and no measures have been implemented.	☒	☐	LISCap terminal report recommends: Topics related with hydraulic calculation, pressure control, leakage survey, and GIS, need further improvement.*1 The score of "Aged pipe rehabilitation plan based on location map" is low.*1
	High leakage rate				
		Many leaks are caused by deterioration of water pipes	☐	☒	A total of 429 km of water pipeline renewal (asbestos and aging pipes) has been completed. The total pipeline network extends 2,634 km, with approximately 400 km still requiring renewal. A USD 20 million loan from the EIB for further renewal was approved yesterday (interview). "Stock control for pipe materials" shows little improvement, this area may need further improvement. *1
		Leak detection is not being carried out systematically	☒	☒	In individual category, scores in "Hydraulic condition analysis" and "Leakage survey" remain low.*1 It was a common perception that there were few surface leaks in the service area of LWB because leak repair had been quickly conducted in their daily work. However, it turned out that most leakages in the first DMA were surface leakages easily detected visually. This observation re-confirms the importance of regular patrol for the early detection of surface leakages. *2
		Water pressure distribution is not controlled	☒	☐	
	Insufficient maintenance				
		There is no up-to-date facility inventory for facility O&M	☒	☒	Strengthening the coherence between GIS and on the ground data Some CPs acknowledges that the coherence of GIS data and data on the ground remains as a challenge. The plumbers often forget recoding the work they have done. Even if the plumbers documented their works, that records were often failed to reaching to the GIS office. Recode keeping is a habitual process, it should be the part of daily work of field staff like fixing pipes and changing the meters. Further, it is necessary to place a system that ensures the recorded data is reaching to GIS office and is updated in the GIS data. The evaluation team recommends that zones and GIS divisions to discuss and agree on how to improve the record keepings and updating on the ground information to the GIS data. *1
		Regular maintenance of equipment is not carried out	☒	☒	The 1.5MVA Diesel Standby Generator at the Northern Booster Station serves as a backup during power outages. When a power outage lasts for one hour, a recovery time of four hours is required.
		No budgeted maintenance plan	☒	☐	
	No DX implementation and low operational efficiency				
		There is no strategy for implementing digital transformation	☒	☐	
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases, smart meters)	☒	☐	Policy Statement 2: Safely managed water supply and waterborne sanitation systems in urban, peri-urban, town and market centres are effectively and efficiently managed. Output 2: Digitization of water supply pipeline networks for ease of monitoring and management undertaken. The SCADA components have been implemented; however, control functionality is not yet in place. Output 3: Use of ICT and latest technologies in the provision of water supply services promoted *15

Boundary	No.	Checklist	Problem		Describe the specific problem
			No	Yes	
	3	Commercial Operations			
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☒	☐	LWB has been conducting the Customer Satisfaction Survey (CSS) in every 3 years. Some areas such as water quality need further improvement. *1
		There is no established process for handling complaints, or there are problems with handling complaints	☒	☐	The significant improvement in customer satisfaction since 2016 was achieved through the implementation of the Turnaround Strategy, which involved increasing investments to renew water pipelines, expanding customer service centers, and other initiatives.
		Low collection ratio			
		The water tariff collection process (including unpaid fees) is not effective/efficient	☒	☐	
		The payment method is inconvenient for customers (customers have some complaints)	☒	☐	
	4	Organization and Human Resource Management Issues			
		Shortage of engineers and skills gap			
		There is a shortage of engineers with specialized knowledge	☒	☐	
		No skills and training strategy or plan	☒	☐	Water Utility Regional Partnership (WURP), Water and Sanitation Corporation (WASAC) of Rwanda, Embu Water and Sanitation Company (EWASCO) of Kenya, and LWB have organized a partnership to learn from one another, share information, and exchange views.*2
		Regular training and development programs are not provided adequately.	☒	☐	
		Declining organizational efficiency			
		There is no annual evaluation and goal setting system for staff	☒	☐	
		Performance-based rewards and promotions are not implemented in the personnel system	☐	☐	LWB will continuously improve our internal processes for effective operations and strengthening of governance structure through establishment of organizational and staff performance measurement system.*7
		No power to hire and fire staff (within the bounds of an agreed	☐	☐	Need to check
		Lack of strategic management capabilities in the organization			
		Not setting and monitoring enough Key Performance Indicators	☒	☐	
		Specific targets and deadlines associated with each strategic objective are not clearly defined.	☐	☐	Need to check
		There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☐	☐	Need to check
		Governance issues			
		Important decision-making processes are not clear and are not made in a collegial manner.	☒	☐	The project also demonstrated the importance of commitment by the management to the reduction of NRW. Their supports to the project did not limit to the material and financial supports but they were also on top of progress of activities and achievements, through attending regular progress meetings and JCCs. It is also important to note that their understanding and patience that the reducing the NRW require a continuous effort, the ratio does not go down an overnight, the path to the NRW reduction will be a winding roads which may be up and down of NRW. The managements understanding helped the project to focus on learning and gaining skills and knowledge of CPs which will lead to the successful reduction of NRW in a long run.*1
		The division of responsibilities within the organization is not clear.	☒	☐	

Boundary	No.	Checklist	Problem		Describe the specific problem
			No	Yes	
External factors	5	Environment (Water Sources)			
		Depletion of water sources and deterioration of water quality			
		Water sources are unstable (there is no stable water source)	☐	☒	- Mbabvi Groundwater Development Project(LILONGWE WATER BOARD FUNDED PROJECT) The objective of this project is to augment existing water sources for Lilongwe Water Board through production of 4,500 m3/day by developing Mbabvi ground water system at Mbavi.*3, 14 - Lilongwe City, in particular, faces unique water security challenges. Lilongwe River – the only source of water for the city is highly variable and very vulnerable during dry years *5,6 - Lake Malawi-Lilongwe Water Supply Project:The scope of the Contract is for the extraction of water from Lake Malawi to the city of Lilongwe, surrounding areas and town centres along the M14 Lilongwe – Salima Road. The Project involves abstraction and treatment of 100,000m3/day water from Lake Malawi (Salima) and transportation of treated water through a 120km transmission pipeline. The Project objective is to increase water availability for Lilongwe City and strengthen capacity of LWB and surrounding towns to respond to adverse climatic conditions, hence sustain reliable water supply to its customers.*9. In April 2023, Parliament approved a Bill allowing government to borrow K105 billion from local banks to finance construction of the water project awarded to Khato Civils/South Zambezi joint venture.*10 Sand mining around the Kamuzu dam is progressing, affecting water quality. During the rainy season, four times the usual amount of coagulant is required for treatment. Turbidity can reach a maximum of 20,000 NTU, with typical levels of 7,000 NTU during the rainy season and a dry season peak of 200 NTU. There are two dams along the 28 km stretch of the Lilongwe River, where sediment settles in Kamuzu Dam, resulting in clearer water. After discharge into the Lilongwe River, tributaries join, contributing to increased turbidity. Development, urbanization, deforestation, and agriculture in the watershed cause significant silt inflow from tributaries into the Lilongwe River during the rainy season. The dam has flushing outlets that prevent silt accumulation by releasing it during floods.The water treatment plant's intake system includes screens and sedimentation tanks, reducing the risk of pump damage. However, screen clogging is a frequent issue. The water treatment plant has been in operation for 30 years, and in the past, high turbidity caused by silt was not an issue. However, due to increased development in the watershed, turbidity levels have significantly risen.
		Water sources are over-exploited (unsustainable)	☒	☐	
		Water sources are affected by pollution and climate change	☐	☒	See above.
	6	Government systems and politics			
		Tariff policy issues			
		No medium- to long-term basic policy for the country's water sector	☐	☐	
		The purpose of the subsidy is unclear	☒	☐	
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☒	☐	
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc).	☐	☐	
		Regulation of water utilities does not function properly	☐	☐	
		The utility does not have the power to make personnel decisions	☒	☐	
	7	Development Partner (DP) Support			
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☒	☐	
		There is no continued donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☒	☐	-The Kamuzu 1 dam Project (2018-2023) *11 Following this work, the dam's capacity increased fivefold, from 5.1 million m3 to 25 million m3. -LILONGWE DROUGHT RESILIENCE (EIB) The project entails construction of a new 50,000m3/day Water Treatment Works. *3 An additional production of 50,000 cubic meters will be realized from the increased water resource. This additional capacity will provide sufficient water to supply an extra 500,000 people in Lilongwe City and surrounding areas, meeting the current demand for the city up to the year 2027.*12,13 -LILONGWE WATER AND SANITATION PROJECT (LWSP) (WB) (Closing date: June 30, 2025) The project scope consists of four components that contribute to the PDO: (i) Component 1 – Network Rehabilitation, Expansion and NRW Reduction; (ii) Component 2– Priority Sanitation Improvements; (iii) Component 3–Technical Assistance; and (iv) Component 4–Institutional Capacity Strengthening. *4,5. As of the fiscal year ending March 2024, 61% of fixed assets are recorded as construction in progress. This primarily relates to sewerage development and other improvements supported by the World Bank. DPs made recommendation for "tariff reviews, performance-based grants to water boards, investment in renewable energy and capacity building on the application of the strategy at the national level" *14
		No continued donor support for capacity development projects	☒	☐	
	8	Socioeconomy			
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate fluctuations, etc.)	☐	☒	The inflation rate 34% in 2023 and 21.9% in 2024. The local currency was devalued by 25% in May 2022 and by 69% in November 2023.
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☐	☒	The cyclones impacts the service areas
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☐	☒	The minimum lending rate by the Reserve Bank of Malawi is 24.9%.

Boundary	No.	Checklist	Problem		Describe the specific problem
			No	Yes	
		Source			
※	1	Final_LiSCaP terminal report_5Nov2024			
	2	Project for Strengthening the Capacity of Non-Revenue Water Reductionfor Lilongwe Water Board (LiSCaP), March 2022			
	3	Annual Report 2021/2022			
	4	https://www.lwb.mw/index.php/lwsp/			
	5	Lilongwe Water and Sanitation Project (P163794) , WB			
	6	https://www.lwb.mw/index.php/lwsp/			
	7	LWB-Strategic-Plan 2020 - 2025-FINAL_3			
	8	JICA2018 マラウイ 国地下水開発及び無収水対策能力強化計画 準備調査報告			
	9	https://www.khatocivils.com/financing-for-the-lake-malawi-lilongwe-water-supply-project/			
	10	https://www.khatocivils.com/khato-mobilises-for-k551bn-water-project/			
	11	https://www.afrik21.africa/en/malawi-kamuzu-1-dam-back-in-operation-after-five-years-work/			
	12	https://www.lwb.mw/index.php/eib/			
	13	https://www.eib.org/en/projects/pipelines/all/20190466			
	14	https://mitc.mw/invest/index.php/investment-opportunities/investment-projects/infrastructure-projects/118-groundwater-resources			
	15	Revised National Water Policy -28- January 2022			
	16	https://www.rbm.mw/Statistics/BankRates the 14th joint sector review meeting report theme: "leveraging water, sanitation and hygiene for peace and well-being" 22nd to 23rd February 2024			
	17				

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

*from here FY end March

K'000	Note	20/6	23/3	24/3
Revenue		22,136,266	29,792,204	37,959,605
Cost of sales		(12,547,039)	(18,995,846)	(19,634,266)
Variable - Chemicals			(1,551,182)	(1,766,665)
Variable - Depreciation		(2,276,675)	(3,025,547)	(1,126,731)
Variable - Electricity			(2,491,681)	(3,718,262)
Fixed - Staff cost (Technical staff)			(5,086,512)	(5,979,838)
1/2 variable - Other			(6,840,924)	(7,042,770)
Gross profit		9,589,227	10,796,358	18,325,339
Administrative expenses		(7,068,460)	(9,486,862)	(11,292,122)
- Donor project expense			(1,046,589)	(1,301,046)
- Provision for doubtful debts (specific)			(1,680,711)	(960,791)
- Staff costs-administration			(3,081,812)	(3,911,788)
- Other			(3,677,750)	(5,118,497)
Other income		71,126	2,727,383	10,933,209
- Exchange gain unrealised			2,530,259	10,598,101
- Other			197,124	335,108
Operating profit		2,591,893	4,036,879	17,966,426
Finance income		46,677	766,299	398,335
Finance costs		(1,268,899)	(3,933,588)	(5,376,090)
Amortised capital contribution		1,256,401	1,829,533	1,882,712
- Amortization of Deferred Income			1,558,143	1,611,248
- Amortization of Capital Contribution			271,390	271,464
Profit before income tax		2,626,072	2,699,123	14,871,383
Income tax expense		(123,346)	(115,947)	(5,386,279)

Profit for the year **2,502,726** **2,583,176** **9,485,104**

Revaluation gain on revaluation 13 - 34,017,779

Deferred tax charged on revaluation surplus 199,563 (1,874,910) (9,811,452)

Total other comprehensive (loss)/ income for the year (1,874,910) 24,206,327

Total comprehensive (loss)/ income for the year **2,702,289** **708,266** **33,691,431**

Growth of Revenue		61%	27%	
KPI	EBITDA	6,124,969	8,891,959	20,975,869
KPI	EBITDA Margin	26.1%	25.9%	41.3%
	EBITDA Margin excluding deferred income	21.9%	21.7%	39.1%
	EBITDA Margin excluding deferred income and other incomes	3.4%	1.9%	16.1%
KPI	Total capital operating margin	2.3%	2.0%	6.2%
KPI	Ordinary profit margin(Profit Before Tax/Total income)	11.9%	9.1%	39.2%
KPI	O&M coverage ratio excluding subsidies (%)	128%	117%	127%
KPI	O&M coverage ratio (%)	135%	124%	134%
	Sold water volume			24,413,797
	Sold price per m3 (USD)			0.90
KPI	Unit Cost of Water Supply (Currency/m³)			0.86
	Overall cost excluding depreciation expense	18,607,723	29,390,749	35,175,747
	Overall cost including depreciation expense	20,884,398	32,416,296	36,302,478
	Total staff cost (technical+administration)	0	8,168,324	9,891,626
	Total staff cost (technical+administration)/Operating cost excluding dep		29%	28%
KPI	Subsidies (000')	0	0	0
KPI	Development Partner grant support (000')	0	1,558,143	1,611,248
KPI	The ratio of subsidies and DP support to turnover	0.0%	4.9%	4.0%

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

1 Current NRW is 40.5% (Physical 30.0% and non-physical 10.5%)				
Reduced NRW is 25% (Physical loss 19% and non-physical loss 6%)				
2 Reduced non-physical loss volume turns to income				
3 Reduced physical loss volume turns to reduction of variable cost without selling available water volume from physical loss reduction				
Financial benefits assuming reduction of NRW		23/3	24/3	Composition of NRW
Actual	Total production	m3/annual		
Actual	Total supply volume per annum	m3/annual	37,954,346	41,005,008
Actual	Water volume sold (Revenue water)	m3/annual	22,317,156	24,233,959
Actual	NRW volume	m3/annual	15,637,191	16,771,048
Actual	NRW ratio	%	41.2	40.9
Assumed	NRW ratio by physical loss	%	30.2	30.0
Assumed	NRW ratio by non-physical loss	%	11.0	10.9
Calculated	NRW by physical loss	m3/annual	11,469,822	12,301,502
Calculated	NRW by non-physical loss	m3/annual	4,167,369	4,469,546
Assumed	Target NRW ratio	%	25	25
Assumed	NRW ratio by physical loss	%	18	18
Assumed	NRW ratio by non-physical loss	%	7	7
Calculated	NRW by physical loss	m3/annual	6,959,843	7,519,256
Calculated	NRW by non-physical loss	m3/annual	2,528,743	2,731,996
Calculated	Water saved from NRW reduction by physical loss	m3/annual	4,509,979	4,782,247
Calculated	Water saved from NRW reduction by non-physical loss	m3/annual	1,638,626	1,737,550
Unit cost and unit tariff rate (MK/m3)				
Calculated	Unit cost (All expenses/sold water volume)	MK/m3	851	810
Calculated	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	MK/m3	716	764
Calculated	Unit variable cost - Variable costs/sold water volume	MK/m3	334	372
Calculated	Unit price - Water & sewerage income/sold water volume	MK/m3	1,335	1,566
Saved cost and increased sales (MK/annual)		Unit:MK'000		
Calculated	Cost saved from NRW reduction by physical loss	MK/annual	1,508,231	1,777,275
Calculated	Revenue generated from NRW reduction by non-physical loss	MK/annual	2,187,477	2,721,664
Calculated	Total value of revenue increased and costs saved by NRW reduction	MK/annual	3,695,709	4,498,939
Total calculated income and expenditure (MK/annual)		Unit:MK'000		
Calculated	Total income	MK/annual	34,707,064	51,614,478
Calculated	Total expenditure before Depreciation	MK/annual	23,948,930	28,022,382
Calculated profits (MK/annual)		Unit:MK'000		
Calculated	Operating Profit Before Depreciation	MK/annual	10,758,135	23,592,096
Calculated	Operating profits before finance costs	MK/annual	7,732,588	22,465,365
Calculated	Net (Loss) Profit Before Tax	MK/annual	(364,647)	19,011,409
Calculated	Profit (Loss) for the year	MK/annual		

Financial indicators assuming NRW reduction		
EBITDA	10,758,135	23,592,096
EBITDA Margin	34%	58%
EBITDA Margin(excluding deferred income)	29%	54%
EBITDA Margin excluding deferred income and other incomes	20%	27%
ROA (Operating profit/asset)	0.3%	0.6%
Ordinary profit margin	-1%	37%
O&M coverage ratio (excluding deferred income)	137%	177%
O&M coverage ratio(including all income)	145%	184%

Financial indicators (Original)		
EBITDA	8,891,959	20,975,869
EBITDA Margin	26%	41%
EBITDA Margin(excluding deferred income)	22%	39%
EBITDA Margin excluding deferred income and other incomes	2%	16%
ROA (Operating profit/asset)	2%	6%
Ordinary profit margin	9%	39%
O&M coverage ratio (excluding deferred income)	117%	127%
O&M coverage ratio(including all income)	124%	134%

STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

*from here FY end March

	K'000	Note	20/6	21/6	22/3 (Revised)	23/3	24/3
Revenue			22,136,266	21,183,251	18,546,956	29,792,204	37,959,605
Cost of sales			(12,547,039)	(14,266,772)	(11,885,344)	(18,995,846)	(19,634,266)
Variable						(1,551,182)	(1,766,665)
- Chemicals						(3,025,547)	(1,126,731)
Variable						(2,491,681)	(3,718,262)
- Electricity						(5,086,512)	(5,979,838)
Fixed						(6,840,924)	(7,042,770)
- Staff cost (Technical staff)							
1/2 variable							
- Other							
Gross profit			9,589,227	6,916,479	6,661,612	10,796,358	18,325,339
Administrative expenses			(7,068,460)	(6,817,278)	(5,087,304)	(9,486,862)	(11,292,122)
- Donor project expense						(1,046,589)	(1,301,046)
- Provision for doubtful debts (specific)						(1,680,711)	(960,791)
- Staff costs-administration						(3,081,812)	(3,911,788)
- Other						(3,677,750)	(5,118,497)
Other income			71,126	889,678	75,526	2,727,383	10,933,209
Operating profit			2,591,893	988,879	1,649,834	4,036,879	17,966,426
Finance income			46,677	46,906	306,144	766,299	398,335
Finance costs			(1,268,899)	(2,551,273)	(2,659,030)	(3,933,588)	(5,376,090)
Amortised capital contribution			1,256,401	2,710,093	1,371,700	1,829,533	1,882,712
- Amortization of Deferred Income				2,131,378	1,297,069	1,558,143	1,611,248
- Amortization of Capital Contribution				82,716	74,631	271,390	271,464
Profit before income tax			2,626,072	1,194,604	668,649	2,699,123	14,871,383
Income tax expense			(123,346)	(31,636)	(74,572)	(115,947)	(5,386,279)
Profit for the year			2,502,726	1,162,969	594,076	2,583,176	9,485,104
Revaluation gain on revaluation	13				-	-	34,017,779
Deferred tax charged on revaluation surplus			199,563	(144,685)	(702,809)	(1,874,910)	(9,811,452)
Total other comprehensive (loss)/ income for the year					(702,809)	(1,874,910)	24,206,327

Total comprehensive (loss)/ income for the year **2,702,289** **1,018,284** **(108,733)** **708,266** **33,691,431**

			-12%	61%	27%	
KPI	Growth of Revenue					
KPI	EBITDA	6,124,969	6,535,242	5,116,682	8,891,959	20,975,869
KPI	EBITDA Margin	26.1%	26.4%	25.6%	25.9%	41.3%
	EBITDA Margin excluding deferred income	21.9%	17.3%	20.1%	21.7%	39.1%
	EBITDA Margin excluding deferred income and other incomes	3.4%	2.3%	2.3%	1.9%	16.1%
KPI	Total capital operating margin	2.3%	0.8%	1.2%	2.0%	6.2%
KPI	Ordinary profit margin(Profit Before Tax/Total income)	11.9%	5.6%	3.6%	9.1%	39.2%
KPI	O&M coverage ratio excluding subsidies (%)	128%	116%	125%	117%	127%
KPI	O&M coverage ratio (%)	135%	131%	134%	124%	134%
	Sold water volume					24,413,797
	Sold price per m3 (USD)					0.90
KPI	Unit Cost of Water Supply (Currency/m³)					0.86
	Overall cost excluding depreciation expense	18,607,723	20,799,053	17,536,530	29,390,749	35,175,747
	Overall cost including depreciation expense	20,884,398	23,635,323	19,631,678	32,416,296	36,302,478
	Total staff cost (technical+administration)	0	0	0	8,168,324	9,891,626
	Total staff cost (technical+administration)/Operating cost excluding dep	0	0%	0%	29%	28%
KPI	Subsidies ('000')	0	0	0	0	0
KPI	Development Partner grant support ('000')	0	2,131,378	1,297,069	1,558,143	1,611,248
KPI	The ratio of subsidies and DP support to turnover	0.0%	8.9%	6.5%	4.9%	4.0%

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

1	Current NRW is 40.5% (Physical 30.0% and non-physical 10.5%)
	Reduced NRW is 25% (Physical loss 19% and non-physical loss 6%)
2	Reducing both physical and non-physical water losses leads to increased revenue.

Financial benefits assuming reduction of NRW			21/6	22/3(9month)	23/3	24/3	Composition of NRW
Actual	Total production	m3/annual					
Actual	Total supply volume per annum	m3/annual	41,019,795	41,019,795	37,954,346	41,005,008	
Actual	Water volume sold (Revenue water)	m3/annual	24,413,797	24,413,797	22,317,156	24,233,959	
Actual	NRW volume	m3/annual	16,605,998	16,605,998	15,637,191	16,771,048	
Actual	NRW ratio	%	40.5	40.5	41.2	40.9	
Assumed	NRW ratio by physical loss	%	29.7	29.7	30.2	30.0	0.73
Assumed	NRW ratio by non-physical loss	%	10.8	10.8	11.0	10.9	0.27
Calculated	NRW by physical loss	m3/annual	12,180,439	12,180,439	11,469,822	12,301,502	
Calculated	NRW by non-physical loss	m3/annual	4,425,559	4,425,559	4,167,369	4,469,546	
Assumed	Target NRW ratio	%	22	23	25	25	
Assumed	NRW ratio by physical loss	%	18	18	18	18	0.73
Assumed	NRW ratio by non-physical loss	%	7	7	7	7	0.27
Calculated	NRW by physical loss	m3/annual	7,521,967	7,521,967	6,959,843	7,519,256	
Calculated	NRW by non-physical loss	m3/annual	2,732,981	2,732,981	2,528,743	2,731,996	
Calculated	Water saved from NRW reduction by physical loss	m3/annual	4,658,471	4,658,471	4,509,979	4,782,247	
Calculated	Water saved from NRW reduction by non-physical loss	m3/annual	1,692,578	1,692,578	1,638,626	1,737,550	
Unit cost and unit tariff rate (MK/m3)							
Calculated	Unit cost (All expenses/sold water volume)	MK/m3	(0)	(0)	851	810	
Calculated	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	MK/m3	0	0	716	764	
Calculated	Unit variable cost - Variable costs/sold water volume	MK/m3	0	0	334	372	
Calculated	Unit price - Water & sewerage income/sold water volume	MK/m3	868	760	1,335	1,566	
Saved cost and increased sales (MK/annual)			Unit:MK'000				
Calculated	Revenue generated from NRW reduction by physical loss	MK/annual	4,042,041	3,539,001	6,020,579	7,490,819	
Calculated	Revenue generated from NRW reduction by non-physical loss	MK/annual	1,468,608	1,285,837	2,187,477	2,721,664	
Calculated	Total value of revenue increased and costs saved by NRW reduction	MK/annual	5,510,649	4,824,839	8,208,056	10,212,483	
Total calculated income and expenditure (MK/annual)			Unit:MK'000				
Calculated	Total Income	MK/annual	26,693,900	23,371,795	38,000,260	51,614,478	
Calculated	Total expenditure before Depreciation	MK/annual	18,247,780	14,877,500	25,457,161	22,308,838	
Calculated profits (MK/annual)			Unit:MK'000				
Calculated	Operating Profit Before Depreciation	MK/annual	8,446,120	8,494,295	12,543,099	29,305,640	
Calculated	Operating profits before finance costs	MK/annual	5,609,850	6,399,147	9,517,552	28,178,909	
Calculated	Net (Loss) Profit Before Tax	MK/annual	(112,024)	406,183	1,420,317	24,724,953	
Calculated	Profit (Loss) for the year	MK/annual					

Financial indicators assuming NRW reduction				
EBITDA	8,446,120	8,494,295	12,543,099	29,305,640
EBITDA Margin	33%	36%	36%	72%
EBITDA Margin(excluding deferred income)	24%	31%	31%	68%
EBITDA Margin excluding deferred income and other incomes	21%	31%	23%	41%
ROA (Operating profit/asset)	0.2%	0.2%	0.3%	0.7%
Ordinary profit margin	0%	2%	4%	48%
O&M coverage ratio (excluding deferred income)	131%	148%	142%	223%
O&M coverage ratio(including all income)	146%	157%	149%	231%

Financial indicators (Original)				
EBITDA	6,535,242	5,116,682	8,891,959	20,975,869
EBITDA Margin	26%	26%	26%	41%
EBITDA Margin(excluding deferred income)	17%	20%	22%	39%
EBITDA Margin excluding deferred income and other incomes	2%	2%	2%	16%
ROA (Operating profit/asset)	1%	1%	2%	6%
Ordinary profit margin	6%	4%	9%	39%
O&M coverage ratio (excluding deferred income)	131%	134%	117%	127%
O&M coverage ratio(including all income)	0	0	124%	134%

The Study on Growth of Water Utilities

Preliminary Analysis of Utility
- Diagnosis and Potential Solutions -

Blantyre Water Board (BWB)

February 2025



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

TEC International Co., Ltd. (TECI)
in association with
Deloitte Tohmatsu Financial Advisory LLC



Deloitte.
デロイト トーマツ

List of Sheets

S. Overall Summary

1. Index diag (Diagnosis by Key Performance Indicators (KPIs))
2. FS analysis (Analysis based on financial statements)
3. Summary of BA (Bottleneck analysis)
4. GS diag (Diagnosis based on growth spiral)
5. Strategy analysis
6. Solutions (Potential solutions)
7. Comparison with LWB (Financial Comparison between LWB and I)
- 3a. Bottleneck analysis (details)
0. Benchmarks
- 7.1. PL-NRW1 (NRW reduction benefit- Case 1)
- 7.2. PL-NRW2 (NRW reduction benefit- Case 2)

S. Overall Summary of Diagnostics and Potential Solution

Utility name : BWB

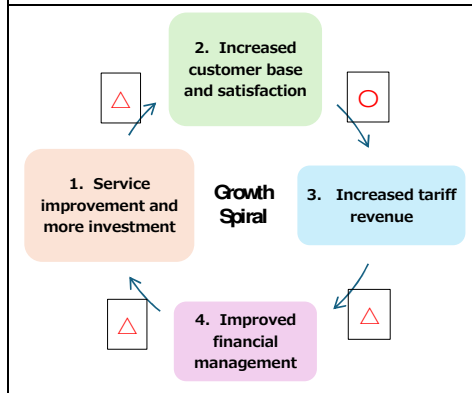
Summary of Growth Spiral diagnostics*1

Overall, the spiral is not working well.

The production capacity and service continuity remain unchanged, with production meeting only two-thirds of the demand. The quality of services, including water quality and supply hours, has yet to show significant improvement. Despite an increase in capital investment in FY2023/24, its impact has not materialized within the same fiscal year. Service coverage remains stagnant, and customer satisfaction appears to be low.

Turnover increased by 27% from FY2022/23 to FY2023/24, primarily driven by tariff adjustments. The collection ratio has remained stable over the past two years. However, the NRW ratio remains persistently high. The O&M coverage ratio (excluding depreciation) has fluctuated between 73% and 79% over the past four years, resulting in continuous net losses. Consequently, investments are largely funded by development partners, with little to no reliance on internal funds.

Overall, as a first step, improving water supply services and enhancing operational efficiency are essential to initiating a positive spiral of development.



*1: Refer to "3.GS diag"

Legend

- Working well
- Working
- △ Not working well

Summary of Bottleneck analysis

Refer to "4.Summary of bottleneck analysis"

1. Low Water Production

Demand is 140,000 m³/day, while design capacity is 121,000 m³/day, but actual production is only 91,400 m³/day. Causes are reduced storage reservoir capacity and a malfunctioning Mudi WTP. Supply meets only two-thirds of demand, leading to water shortages.

2. High NRW Ratio

A department exists, but no structured system, or strategies. Only surface leaks are identified. 5,600 regular meters and 4,765 prepaid meters are malfunctioning and need replacement. 50-year-old asbestos cement pipes contribute to high water loss and pressure fluctuations. Pipe replacement with WB support, expected to reduce NRW, but no technical cooperation is planned.

3. High Operating & Maintenance Costs

Main cost factor is electricity expenses account for 46% of total O&M costs due to Blantyre's elevation and pumping requirements. Some pumps operate at only 50% efficiency, increasing costs. The World Bank is supporting the renewal of Mudi WTP, which has lower production costs than Walkers Ferry, expected to reduce electricity costs.

4. Low Collection Ratio

Collection ratio improved, but delayed payments from public institutions impact cash flow and investment capacity. Disconnections have led to illegal connections, private wells, and unauthorized water sellers. Prepaid meters are being installed to address this issue.

5. Need for Enhanced Training & Efficiency

No structured training system or operation manuals exist, despite having a human resource development plan. New employees rely on informal learning, risking the loss of technical skills when experienced staff retire. Inefficient maintenance results from a lack of systematic skill transfer.

6. Need for a Mid-Term Recovery Plan & Swift Implementation

Given BWB's financial and operational challenges, a mid-term recovery plan is needed with swift implementation. While a Turnaround Strategy has been created, BWB needs to strengthen its capacity in planning, implementation, and monitoring to effectively address challenges.

(External factors)

7. Difficulty in Regular Tariff Adjustments

O&M coverage ratio has remained 70%–78% over the last four years, leading to continuous net losses. Tariff revisions have been made, but revenue is still insufficient for cost recovery. High inflation in Malawi increases the need for automatic or regular tariff adjustments, but the lack of an independent regulatory body makes this difficult.

8. Impact of Natural Disasters (Cyclones)

Cyclones in 2022 and 2023 damaged water infrastructure and led to waived payments, negatively affecting revenue. Repair costs were covered using existing funds, but reserving disaster recovery funds from water revenue is difficult.

9. Macroeconomic Challenges & High Inflation

Recommendations for Improvement

Refer to "5.Strategy analysis"

Mid-term Goal:

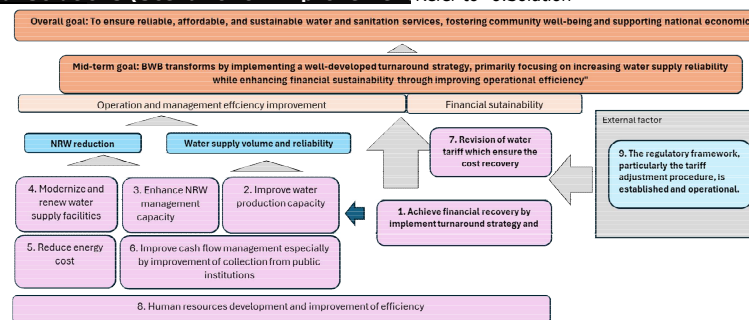
Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by high electricity costs. Revenue from water sales is insufficient to cover even basic operation and maintenance (O&M) costs or to fund investments in water supply infrastructure. These challenges prevent BWB from achieving service improvements. The turnaround strategies have been prepared by BWB. The following are expected outcomes.

- Improved operational efficiency, Improved financial position, Improved staff productivity, Improved corporate governance, Improved water supply, and Improved customer service

The persistently high NRW rate presents a significant challenge, stemming from inadequate strategies and limited budgets. Strengthening the capacity of the specialized NRW department, formulating targeted strategies, and addressing commercial losses are crucial steps. High operating costs, particularly electricity expenses, pose a significant challenge due to the geographical constraints of Blantyre City. The replacement of aged pipes, the discount of electricity costs and construction of solar power plants are expected to alleviate financial conditions. The renewal of the Mudi water treatment plant will improve water supply reliability. Additionally, inefficient maintenance practices remain critical issues. These can be addressed by developing comprehensive operation manuals and enhancing the training system to facilitate effective transfer of technical skills. Revisiting and updating the existing human resource development plan is essential for ensuring sustained and effective human resource capacity. Given the current support provided to BWB by the World Bank but not by the EXIM Bank of India, it is necessary to explore opportunities for achieving a collective and sustainable impact.

Potential Solutions (Scenario for Improvement)

Refer to "6.Solution"



1. Diagnostics based on indicators (Index diag)

3/7/2021

Unit: Thousand local currency

Category	Category in growth spiral	No.	Key Performance Indicators (KPIs)	Calculation	Utility name: BWB				Improve ment	Stage of growth				Source			Remarks (Additional information)	Initial diagnosis by indicator	
					KPI Values					2020/21	2021/22	2022/23	2023/24	2020/21	2021/22	2022/23			2023/24
Service level	1. Service Improvement and Investment Activities	1	Investments cost (Currency)	Payments to acquire tangible assets	1,491,606	510,132	1,275,999	6,096,597	↗	-	-	-	-	D	D	D	D	Fluctuated but increase it rapidly in 2023	
		2	Production capacity (m³/day)	-	123,000	123,000	123,000	123,000	→	-	-	-	-	A	A	A	C		
		3	Production (m³/day)	-	93,050	89,991	-	91,415	→	-	-	-	-	A	A	A	A	B	
		4	Utilization ratio of production capacity (%)	-	76%	73%	-	74%	→	-	-	-	-	-	-	-	-	-	
		5	Continuity of Service (Hrs/day)	-	18	22	22	22	→	2	2	2	2	A	A	A	B		
		6	Quality of water supplied (Compliance rate: %)	-	98	93	93.8	86.2	↘	4	4	4	3	A	C	C	C	An average value was calculated based on 6a in the bottom of the table.	On average, the compliance rate was decreased in 2023.
		7	Water supply pressure	-	-	-1 to 3.0	-1 to 3.0	-1 to 3.0	→	2	2	2	2					Unit: bar	Due to low water supply and network bottlenecks. * C
		8	Leakage ratio (%)	-	-	ND	ND	ND	?	-	-	-	-	-				C	No data
Business scale	2. Customer Increase and Trust	9	Population served	-	-	-	-	1,260,873	↗	-	-	-	-	-				C	
		10	Active Connection	-	66,561	69,561	71,974	80,832	↗	-	-	-	-	-					
		10	Service coverage / Water coverage (%)	Served population / Population in the service area	85.8	86.0	86.0	87.0	→	3	3	3	3	A	C	C	C		
		11	Customer satisfaction (%)	-	-	25.1	-	25.2	→	NA	1	NA	1	H	H	H	H	Overall Customer Satisfaction Index (CSI). The satisfaction survey conducted in 2024 showed a satisfaction rate of 19–24%.	
		12	Water sold (m³/day)	-	45,161	52,136	46,879	49,580	Updown	-	-	-	-	E	G	F	F		
Cost-effectiveness	3. Water Tariff Profitability Improvement	13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	Water sold / Served population	#DIV/0!	#DIV/0!	#DIV/0!	39.3	→	-	-	-	-	-					
		14	Turnover	Revenue from water service	16,656,579	15,417,388	23,704,485	30,160,723	↗	-	-	-	-	D	D	D	D	FY2021 figures are for a 9-month	Increased by 27% in the last year
		15	Collection ratio (%)	collected/ billed for the year	151	82	97	99	↗	4	2	3	4	A	C	C	C	Collected revenue / Billed revenue as a %	The collection ratio is largely affected by the delay in government payment of bills * C
			Collection ratio (%) (Collected/ Current billed + arrears)	-	96	64	74	77	↗									Answer by query	
		16	Non-revenue water ratio(%)	-	53.6	53.8	53.0	55.0	→	1	1	1	1	A	C	C	C		
		17	Metering ratio (%)	-	100	100	100	100	→	4	4	4	4	A	C	C	C		
Prerequisites		18	Water tariff level (USD/6M3)	-	4.15	4.87	5.60	6.09	↗	-	-	-	-	-					
		19	Accounting system	-	-	-	-	-	→	3	3	3	3						
Profitability		20	Net income (Currency)	-	-13,831,189	-8,187,960	-20,692,852	-33,589,025	↘	-	-	-	-	D	D	D	D	FY2022 figures are for a 9-month	Recent two years are impacted by the exchange loss.
		21	EBITDA (Currency)	Gain/Loss before tax + Finance cost + Depreciation + Amortization	-6,215,660	-4,210,640	-14,309,924	-28,217,360	↘	-	-	-	-	D	D	D	D	FY2022 figures are for a 9-month	Recent two years are impacted by the exchange loss.
		22	EBITDA margin (%)	EBITDA / Income (Sales)	-35	-27	-59	-86	↘	1	1	1	1	D	D	D	D		Recent two years are impacted by the exchange loss.
		23	EBITDA margin excl. deferred income (%)	(EBITDA - Deferred income) / Income (Sales)	-43	-28	-60	-100	↘	1	1	1	1	D	D	D	D		The deferred income increased in FY 2023/2024.
			EBITDA margin excl. Exchange loss	(EBITDA - Exchange loss) / Income (Sales + Other income)	-35	-27	-38	-31	→	1	1	1	1	D	D	D	D	This index is added to exclude the impact of exchange fluctuation	The last two financial was impacted by exchange loss significantly.
		24	Total capital operating margin (%)	Operating profit incl. deferred income / Total asset	-13	-10	-17	-17	→	-	-	-	-	D	D	D	D		This figure is excluding the impact of exchange loss, thus stable
		25	Operating Profit Margin(%)	Operating profit incl. deferred income / Total income	-58	-49	-61	-49	→	1	1	1	1	D	D	D	D		This improvement is due to the increase of income and grant income
			4. Management and Financial Improvement	26	Equity ratio (%)	Equity / Total asset	-6	-17	9	-27	↘	2	2	2	2	D	D	D	D
27	Fixed long term conformity rate (%)			Fixed asset / Fixed liability	174	222	132	160	→	2	2	2	2	D	D	D	D		
Financial soundness		28	O&M cost coverage ratio (%)	(Operating income) / Operating cost (incl. administration cost, excl. dep)	74	79	73	76	→	1	1	1	1	D	D	D	D		This low ratio is concern
		29	O&M cost coverage ratio excluding subsidies (%)	(Operating income excl. deferred income) / Operating cost (incl. administration cost, excl. dep)	70	78	72	71	→	1	1	1	1	D	D	D	D		This low ratio is concern
		30	Unit cost of water supply (Currency/m³) (Overall cost including DEP/Water sold)	Overall cost including DEP/Water volume sold	1,489	1,074	1,941	2,120	-	-	-	-	-	D	D	D	D	1,487 MK/m3 in LWB	
		31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	Turnover from sales/ Water volume sold	1,010	810	1,385	1,667	-	-	-	-	-	D	D	D	D	1,555 MK/m3 in LWB	
			Overall cost excluding depreciation expense	Operating cost excl. dep.	20,314,398	16,894,560	27,560,485	32,620,642	-	-	-	-	-	D	D	D	D	FY2022 figures are for a 9-month period	
			Overall cost including depreciation expense	Operating cost excl. dep.	24,548,744	20,441,423	33,205,298	38,370,863	-	-	-	-	-	D	D	D	D	FY2022 figures are for a 9-month period	
		32	Subsidies (Currency)	Deferred governmental subsidies in P/L	0	0	0	0	→	-	-	-	-	-	D	D	D	D	
		33	Development Partner grant support (Currency)	Deferred DP's grant in P/L	1,042,110	214,576	141,403	2,207,156	↗	-	-	-	-	D	D	D	D		
HR efficiency		34	The ratio of subsidies and DP support to turnover	Deferred subsidies + grant / total income	5.8	1.4	0.6	6.8	↘	-	-	-	-	D	D	D	D		
		35	Number of staff per 1,000 connections	-	10	9	9	9	→	2	2	2	2	A	C	C	C		While the number has been decreasing from 11 in 2017, it is still high
Macro data		6a	Quality of water supplied (Compliance rate: %)	-	-	pH: 99 Turbidity: 99 Residual Chlorine: 67 Colour: 100 Bacteriology: 100	-	pH: 100 Turbidity: 95 Residual Chlorine: 75 Colour: 99 Bacteriology: 100	-	-	-	-	-						
			Inflation	-	8.6	9.3	21	28.8	i	-	-	-	-	-	-	-	-	3 year average	19.7
			Exchange rate	-	27/5/2022	4/6/2022	4/11/2023	11/11/2023	j	-	-	-	-	-	-	-	-	-	-
				-	801	1020.2	1113	1673.5		-	-	-	-	-	-	-	-	-	-
				-		27%	9%	50%		-	-	-	-	-	-	-	-	-	-

* Note the FY2021/2022 was ended on June, the duration is only 9 months. From the following financial year, it ends on March.

Source A Utility Profile, The 2nd Executive Forum for Enhancing Sustainability of Urban Water Services in Sub-Saharan Africa, March 2023
 B The BWB Madzi newsletter Issue No002 (January -March 2024)
 C Questionnaire answer on 3rd Dec. 2024
 D Financial statements
 E NRW/BWB-EasyCalc2020 2021
 F Monthly NRW Information BWB
 G WB 2021 2022
 H 2023-2024 Customer Satisfaction Survey Final Report
 i <https://www.macrotrends.net/global-metrics/countries/MWI/malawi/inflation-rate-cpi>
 j <https://www.google.com/finance/quote/USD-MWK?window=5Y>

2. Analysis based on financial statements (FS analysis)

Summary

- BWB has recorded loss before tax continuously at least from 2015. This is because its O&M coverage ratio (excluding depreciation) has been around 70% to 78% for last four years, leading to continuous net loss. The EBITDA has been negative and it worsened for last two years due to the increase of exchange loss on its foreign currency denominated borrowings. Exchange losses account for 55% of the deficit in FY2024.
- Total liabilities exceed total asset by 25 billion, indicating severe financial distress. It became positive only in FY2023 due to the capital injection by the government (34 billion MK) for payment of 23 billion MK related party payables, mainly to ESCOM. The accumulated losses amount 98 billion in FY2024.
- The ratio of grant income to total income increased to 7% in FY 2024 from 1% in the previous year.

Positive

- The government showed supportive attitude by capital injection in FY2022/2023.

Negative

- The O&M cost coverage ratio has been very low with around 70% to 78% for last four years.
- Total liabilities exceed total asset by 25 billion, indicating severe financial distress. The accumulated losses amount 98 billion in FY2024.
- Long-term loans (current and non-current) in FY2024 increased by 39% (18 billion) to 66 billion over the previous year, mainly due to the unrealised exchange loss (12 billion) on foreign currency borrowings from Exim Bank.

Analysis		Analysis
No.	Category	
1	Basic information	
	Accounting standards	- Accrual accounting. The fixed asset is revalued regularly.
	Comments by auditor	- The auditor noted a material uncertainty that may cast a significant doubt on BWB's ability to continue as a going concern, because for the past three years, BWB has been reporting losses before tax and has been in a net current liability position.
2	P/L	
	Profitability	- O&M coverage ratio (excluding depreciation but including maintenance and salary) has been around 70% to 78% for last four years, leading to continuous net loss. - The EBITDA has been negative and it worsened for last two years due to the increase of exchange loss on its borrowings. - While total income increased by MK 8 billion to 32 billion, the overall cost incl. depreciation increased by 9.7 billion, leading to widen the loss. This increase was due to 1.7 billion increase of "operation, repairs and maintenance costs", 2.3 billion increase of staff costs, 1.2 billion increase of impairment cost, 2.1 billion increase of IDA Malawi water and sanitation. - There was tariff increase in November 2022 and June 2023. - Total capital operating margin has been negative.
	Revenues Composition	- Total income is consisted of revenues from water service and other income. Even though the grant income increased in the last financial year, it is only 7% of the total income. Thus it is not reliant on the grant nor subsidy. BWB does not have sanitation service. - The grant received in FY2023/2024 will be recognized as revenue in the future.
	Subsidy details and trends	- Grant income in FY 2023/ 2024 is from IDA. BWB does not receive any subsidy from the government. - The ratio of grant income to total income increased to 7% in FY 2024 from 1% in the previous year.
	Expenses Composition	- The major component of the operating costs is electricity 35%, Staff costs 18%, "Operational, repairs and maintenance costs" 16%. - The exchange loss increased significantly to 18 billion in FY 2024, which is incurred on the foreign currency denominated
3	B/S	
	Financing	- Total liabilities exceed total asset by 25 billion, meaning financial distress. It became positive only in FY2022/2023 due to the 23 billion related party payable were paid by 34 billion government recapitalisation injection. The accumulated losses is 98 billion in FY2023/2024. - Long-term loans (current and non-current) in FY2024 increased by 39% (18 billion) to 66 billion over the previous year, mainly due to the unrealised exchange loss (12 billion) on borrowings from Exim Bank of foreign currency loans. 94% of the long term borrowings is on lent from Malawi government. There were no drawdown of loans for last two years. Other than this, BWB borrows from three commercial banks for investments and operations
	Fixed Assets	- Reticulation accounts for 45% of fixed assets, followed by plant, buildings, and land. - Assets under construction increased to 4 billion in FY2024, but is only 5.4% of total fixed assets. - Since grants are received in FY2023/2024, this will support investments in the next financial year.
	Accounts Receivable	- Turnover of accounts receivable is 55.5 days of the sales. However this does not reflect the reality because of the high inflation and high increase of sales by 27%. Delayed payment from public institutions hampers cash management.
	Related party payables	- The related party payable accounts for 13% of the total assets. Almost all of it is payable to ESCOM. BWB has delayed its payment due to the lack of financial capacity.
4	C/F	
	Trends	- In FY2022/2023, BWB paid the accumulated payable to related parties in a lump sum, resulting in a large negative operating CF, which was compensated by cash inflows from recapitalization. Although there is no detailed information on recapitalization, it is consistent with the incremental capital contribution on the BS, which suggests that there was an increase in capital due to government investment. - While the "operating cash flows before movements in working capital" in FY2023/2024, was -12 billion, the "cash generated from operation" became 5 billion, largely due to incurring repayable to related parties. Also, BWB received 13 billion grants, which supported cash position. - For four years till FY2022/2023, BWB did not receive any grants. Grants received in FY2022/2023 (11 billion) was from IDA, EU, and EIB. This supported cash position.

JICA Exchange rate in Nov 2024

1MK= 0.08897 Yen
 1USD= 153.234 Yen
 1MK= 0.00058 USD
 GDP per capita (US\$)

3. Summary of bottleneck analysis

Summary of bottleneck analysis

Bottleneck analysis

1. Low water production capacity

While the estimated demand of 140,000 m³/day, BWB has design capacity of 121,000 m³/day. However, the current production is only 91,400m³/day due to reduced capacity of storage reservoir and deteriorated water treatment plant in Mudi. This production meets only two-thirds of the demand, highlighting low production capacity.

2. High NRW ratio

The NRW rate is as high as 55%. A department for NRW management has been established, but the NRW management system is not yet in place. Strategies and plans for NRW measures have not been developed, and sufficient budgets have not been allocated. Therefore, effective activities cannot be implemented, and the NRW ratio remains high. Limited NRW equipment is a major challenge, as only basic tools are available. Currently, leak detection is limited to surface leaks, while 2000 leak cases per month are reported. Illegal connections are a problem as a reason for commercial losses. There are large number of malfunctioned regular (5,600) and prepaid meters (4,765), which need to be replaced. Additionally, aged infrastructure, including 50-year-old asbestos cement pipes needs replacement to reduce water loss and handle pressure fluctuations. This challenge is tackled with support of the World bank. BWB is replacing its aged pipes and it is expected that NRW will decrease after its completion. No technical cooperation to reduce NRW is planned.

3. High Operating and Maintenance Costs

The unit cost of water supply (2,700 MK/m³) is 1.8 time higher than that of LWB (1487 MK/m³). Currently, 46% of the total operating costs is composed by electricity expenses. This is due to the geographical factors of Blantyre City (distance and elevation differences from the water treatment plant), which require a significant amount of electricity for pumping. This high electricity cost is the main cause of high O&M costs, leading to the low O&M cost coverage ratio. Declining pump efficiency is a major challenge, with some pumps operating at only 50% efficiency.

The World bank is supporting the renewal of the aging Mudi water treatment plant. The production cost of this water source is much lower than water source in Walkers Ferry. This will lead to some reduction of electricity costs.

4. Low collection ratio

Accounts with unpaid bills for three months are disconnected. As a result of disconnections, there has been an increase in illegal connections and the use of private wells, which is impacting BWB's water sources. Additionally, unauthorized water sellers have emerged. Collection ratio (%) (Collected/ Current billed + arrears) improved from 64% to 77% over the last three years. This low collection rate is due to delayed payment from public institutions. This hampers cash management and ability to investments. To address this, prepaid meters are being installed.

5. Need for enhancement of training and efficiency

While a human resource development plan exists, there are no operation manuals, and the training system is inadequate. New employees learn informally from experienced staff. As a result, this leads to inefficient maintenance. There is a risk that required technical skills are not passed down following the retirement of veteran technicians.

6. Need for mid-term plan for recovery and swift implementation

Given the financial and operation challenges of BWB, it needs to have mid-term plan to improve and implement it swiftly. While BWB already created turnaround strategy, BWB need to enhance its capacity of planning, implementation, and monitoring of the plan since the challenges in many areas.

(External Factors)

7. Difficulty of regular tariff adjustment to reflect cost increase

O&M coverage ratio (excluding depreciation) has been around 70% to 78% for last four years, leading to continuous net loss. Since 2018, the tariff was frozen until 2021. The tariff was revised in November 2022, June 2023 and twice in 2024. However, the water revenue is not a cost recovery level. In addition, the automatic or regular tariff adjustment is especially needed due to the recent Malawi's high inflation. The lack of an independent regulatory body makes water tariff adjustments difficult.

8. Natural disasters such as Cyclones

The city of Blantyre suffered major cyclone damage in 2022 and 2023. This caused negative impact on the revenue due to wavering of some payment from affected population. In addition, water infrastructure was damaged. While the magnitude of this impact is not clear, it seems some fund are used to repair and reconstruct the damaged infrastructure. It is difficult to reserve fund for those natural disaster at each WB level by the water revenue.

9. Macroeconomic challenges, especially the high inflation

Malawi has experienced high inflation and currency devaluation, which have adversely impacted financial sustainability. Without tariff adjustments and improvements in operational efficiency, these economic conditions pose significant financial challenges.

In addition to that, Malawi government is undergoing to adjustment and reforms, committed under the Extended Credit Facility (ECF) arrangement with IMF. This might be a reason for the change of cash management of WB. The government decided for the WBs to deposit its cash to central bank from April 2025. Those tightening financial management might affect the WBs.

List of bottleneck analysis results and recommendations for improvement

No	Issues	Challenge	Confirmation required	Diagnostics	Recommendations for improvement	Countermeasure period*2
Internal Factors						
1.	Management and finance					
	Issues with accounting consistency and transparency	☐	-			
	Low profitability	☒	☒	BWB faces poor financial performance due to tariffs which leads to low operating cost coverage ratio, high O&M costs, and poor governance. Over the past five years, working ratios have exceeded 1.4, eroding equity and reserves. Approximately 85% of water is supplied from the Walker's Ferry Water Treatment Plant, over 40 km away, leading to high electricity costs for pumping water up an 800-meter elevation. This results in significant financial and operational stress, with energy costs accounting for 46% of total operating costs. The technical complexities and aging infrastructure further elevate operational costs and NRW.	WB is supporting this issue.	
	Challenges in the process of setting tariff		TRUE	A 30% water tariff increase was proposed according to high inflation, but the Ministry of Water approved only a 10% increase. The target for achieving break-even next year relies on reducing NRW. The lack of an independent regulatory body makes water tariff adjustments difficult. There is no water tariff calculation model, and only the revenue requirement formula is in place.		
	Lack of investment capital	☒	TRUE	Need to check		
2.	Service provision and maintenance					
	The water supply coverage ratio and the population served are not growing.	☒		Nearly 70% of the city's population lives in unplanned, informal settlements with high poverty, overcrowding, poor road access, and limited basic services. Currently, there are over 10,000 pending connection requests, but limited water supply capacity prevents further expansion. Increasing treated water production is essential.		
	Insufficient infrastructure development	☒		- The average water production of 88,700 m ³ /day meets only two-thirds of the demand, highlighting low production and distribution infrastructure capacity. Additionally, aging infrastructure, including 50-year-old asbestos cement pipes, water treatment plants, pumping stations, and pipelines, needs replacement to reduce water loss and handle pressure fluctuations. - The Mudi Dam was constructed in 1955 and has not been dredged since then. As a result, silt has accumulated at the bottom, significantly reducing the dam's storage capacity. The Mudi Water Treatment Plant was built in 1929 with a maximum production capacity of 45,000 m ³ /day (1,500,000 m ³ /year). However, its current output has decreased to 9,000 m ³ /day, and during the dry season, it further declines to 4,000 m ³ /day. This year, the water source dried up four months ago, forcing the plant to cease operations. In addition to the decreasing water source, the plant's capacity itself has deteriorated, requiring rehabilitation. The water treatment plant was originally intended to supply 40% of the total water volume, but its output has declined. The remaining supply comes from the Shire River (80,000–90,000 m ³ /day) and the Nguludi WTP (Likhubula River) at 20,000 m ³ /day. Currently, the distribution is 80% from the Shire River and 20% from Nguludi. The Shire River has high silt accumulation, deteriorating water quality. During the rainy season, the river carries excessive mud, making treatment impossible, requiring a temporary halt in supply. Turbidity can reach as high as 13,000 NTU. Although the total maximum supply capacity is 122,000 m ³ /day, the actual supply is 100,000–110,000 m ³ /day, while demand is 140,000 m ³ /day, resulting in a shortage. The current water supply duration varies by area, ranging from 16 to 18 hours per day. Frequent power outages during the rainy season further impact water distribution.	WB is supporting replacing aged pipes.	
	High non-revenue water (NRW) rate	☒		The reason for the high NRW includes commercial losses. BWB faces challenges from vandalism and illegal connections, exacerbated by weak management and public attitudes towards water theft. Staff involved in meter reading and billing lack awareness of process issues, with insufficient training and no manuals, leading to inaccurate operations. Despite increased water supply and customer numbers, water sales have stagnated due to these deficiencies. Prepaid meters were introduced in 2017. At that time, NRW was 37%. However, revenue decreased. The main meters are mechanical, but the sensor-based components did not function properly, resulting in underreporting of water consumption. Faulty meters have been replaced to reduce commercial losses. A total of 32,000 prepaid meters were installed, of which 8,000 have been replaced, leaving 24,000 currently in operation. The NRW department, established in 2019, is understaffed (10 out of 27 planned staff). There are no committed NRW reduction projects, and the department's framework is incomplete. Setting future NRW targets and developing specific plans and financial strategies are crucial.	Strengthening the specialized NRW department, formulating effective strategies, and addressing commercial losses	Urgent
	High leakage rate	☒		Replace asbestos cement pipes (AC) which were laid over 50 years ago to withstand water pressure fluctuation for the purpose of elimination of water loss. Limited NRW equipment is a major challenge, as only basic tools are available. Currently, leak detection is limited to surface leaks, while 2000 leak cases per month are reported. The system still faces significant operational challenges due to inadequate configuration, pipe aging, and lack of pressure control instruments.	WB is supporting this issue.	
	Insufficient maintenance of facilities	☒		High operational inefficiencies driven by lack of operational procedures and low staff productivity. Declining pump efficiency is a major challenge, with some pumps operating at only 50% efficiency. The primary causes include insufficient maintenance resources and wear and tear of internal components.	See "Shortage of engineers and skills gap"	Urgent
	Water outage and unstable supply					
	No DX utilization and low operational efficiency					
3.	Commercial Operations					
	Low customer satisfaction	☒	☒	Top three complaints: Financial complaints, Engineering complaints, and Meter/Connection Complaints*9 The long response time for handling customer queries has been identified as a major issue. The faulty meter reporting system also faces challenges, as plumbers currently receive manual instructions for handling issues. Water shortages due to source depletion are another major issue, which cannot be immediately resolved. Customers need to be informed about these challenges and ongoing processes.		

No	Issues	Challenge	Confirmation required	Diagnostics	Recommendations for improvement	Countermeasure period*2
	Low collection rate	☒	☒	Under the Debt Collection Policy, accounts with unpaid bills for three months are disconnected. However, delayed payments by government institutions remain a significant issue. 38% of accounts receivable are from public institutions. To address this, prepaid meters are being installed. As a result of disconnections, there has been an increase in illegal connections and the use of private wells, which is impacting BWB's water sources. Additionally, unauthorized water sellers have emerged. Prepaid meters have an issue with underreporting, as the mechanical and electronic components do not function properly together. Consequently, the measured values from the mechanical component are underreported when transferred to the electronic component.		
4.	Organization and Human Resource Management					
	Shortage of engineers and skills gap	☒		The Human Resource Strategic Plan 2020-2025 was prepared in January 2021. It is revealed that while a human resource development plan exists, there are no operation manuals, and the training system is inadequate. New employees learn informally from experienced staff, risking the loss of technical skills upon their retirement. Establishing a comprehensive human resources development system with operation manuals, training, and capacity assessments is urgently needed.	Need to establish a human resources development system that has a series of cycles: the formulation of a range of operation manuals, passing down technical skills through training, and achievement evaluation by means of capacity assessment of employee	Urgent
	Reducing organizational inefficiency	☒	TRUE	The number of staff per connection is high		
	Lack of strategic management capabilities in the organization					
	Lack of planning	☐				
	Governance issues		☒	Need to check		

No	Issues	Challenge	Confirmation required	Diagnostics	Recommendations for improvement	Countermeasure period*2
External factors						
5.	Environment (Water Sources)					
	Depletion of water sources and deterioration of water quality	☒		Power outages lead to prolonged interruptions. The city is also vulnerable to climate-related events, with frequent interruptions from high sediment loads, deteriorating water quality, and aging infrastructure. In February 2022, Cyclone Ana caused a three-day water outage as sediment-laden floods affected both water sources and damaged the network.	WB is supporting this issue.	
6.	Government systems and politics					
	Hindering self-sustaining operations	☒		Several institutional development challenges: -Lack of a clear water resources management strategy. -Outdated water and sanitation investment plan. -Inadequate investment planning and implementation capacity. -Limited sector financing. -Absence of a regulatory body and accountability mechanisms.	The project, BWSP, will finance policy and planning instruments, including the feasibility assessments and engineering design of priority infrastructure investments for selected Boards, training, and equipment to enhance the sector coordination and technical support to the water boards.	
	Challenges in Water Supply Policy					
7.	Development Partner Support					
	Lack of development partner support	☐	☐			
8.	Socioeconomic Finance					
	Socioeconomic Impact	☒	☒	The inflation rate 34% in 2023 and 21.9% in 2024. The local currency was depreciated rapidly by 50% from 2022 to 2023.		
	Lack of financial resources	☒	☒			

4. Diagnosis based on Growth Spiral (GS diag)

Overall diagnosis of growth spiral

Overall, the spiral is not working well.

The production capacity and service continuity remain unchanged. Its production meeting only two-thirds of the demand. The quality of services, including water quality and supply hours, have not yet shown significant improvement. Despite an increase in capital investment in FY2023/24, its impact has not yet materialized within the same fiscal year. The service coverage remains stagnant, and customer satisfaction is still low. Turnover increased by 27% from FY2022/23 to FY2023/24, primarily driven by tariff adjustments. The collection ratio has remained stable over the past two years. However, the NRW ratio remains persistently high. The O&M coverage ratio (excluding depreciation) has been as low as between 73% and 79% over the past four years, resulting in continuous net losses. Consequently, its investments are largely funded by development partners, with little to no reliance on internal funds.

Overall, as a first step, improving water supply services and enhancing operational efficiency are essential to initiating a positive spiral of development.

Growth spiral diagnostics

(1→2) Is the service improvement leading to an increase in the number of customers?	
Diagnosis result	- The spiral from cycle 1 to cycle 2 is not working well. - The investment cost from FY2020/2021 to FY2022/2023, were less than its depreciation each year. The rise of capital investment FY2023/24 is still under construction. Thus the effect did not appear in the FY2023/2024. -The production capacity and service continuity remain unchanged. However, the actual production capacity is significantly lower than the design capacity, leading to severe water shortages, especially during the dry season, despite the low utilization rate of the production capacity. The production meets only two-thirds of the demand. - Currently, there are over 10,000 pending connection requests, but limited water supply capacity prevents further expansion. Increasing treated water production is essential. - The average compliance rate for the quality of supplied water declined in 2023/24, dropping to stage 2. Customer satisfaction was not good in 2022/23.

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
1	Investment cost (Currency)	6,096,597	-	↗	
2	Production capacity (m/day)	123,000	-	→	1
3	Production (m/day)	91,415	-	→	1
4	Utilization ratio of production capacity (%)	74%	-	→	
5	Continuity of Service (Hrs/day)	22	2	→	
6	Quality of water supplied (Compliance rate: %)	86	3	↘	
7	Water supply pressure	-1 to 3.0	2	→	
8	Leakage ratio (%)	ND	-	-	

(4→1) Is the financial improvement leading to investment activities?	
Diagnosis result	- The major investments are funded by development partner's loan. BWB does not have the capacity to fund capital investments.

Legend	Note: The evaluation of whether a spiral is working or not is evaluated based on the indicators in red.
○ Working well	
○ Working	
△ Not working well	

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
9	Active Connection	80,832	-	↗	2
10	Service coverage / Water coverage (%)	87	3	→	2
11	Customer satisfaction (%)	25.2	NA	→	2
12	Water sold (m/day)	49,580	-	Updown	2,6
13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	39	-	→	

(2→3) Is the increase in the number of customers leading an increase in tariff revenue?	
Diagnosis result	- The growth spiral is working with increased service connections, and tariff increase. Sold water volumes are ups and downs. - The water consumption (water sold) per capita is low.

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
14	Turnover	30,160,723	-	↗	3,7
15	Collection ratio (%)	99	4	↗	
16	Non-revenue water ratio(%)	55	1	→	5
17	Metering ratio (%)	100	4	→	
18	Water tariff level (USD/6M3)	6	-	↗	

KPI #	KPI	Data (2023/24)	Stage of growth	Trend	Steps for improvement
19	Accounting system	IFRS	3	→	
20	Net income (Currency)	-33,589,025	-	↘	4,8
21	EBITDA (Currency)	-28,217,360	-	↘	
22	EBITDA margin (%)	-86	1	↘	4,8
23	EBITDA margin excl. deferred income (%)	-100	1	↘	4,8
24	Total capital operating margin (%)	-17	-	→	
25	Operating Profit Margin(%)	-49	1	→	
26	Equity ratio (%)	-27	2	↘	
27	Fixed long term conformity rate (%)	160	2	→	
28	O&M cost coverage ratio (%)	76	1	→	4,8
29	O&M cost coverage ratio excluding subsidies (%)	71	1	→	4,8
30	Unit cost of water supply (Currency/m³) (Overall cost including DEP/Water sold)	2,120	-	-	1.23
31	Supply price (Currency/m³) (Turnover from sales/ Water sold)	1,667	-	-	0.97
32	Subsidies (Currency)	0	-	→	
33	Development Partner grant support (Currency)	2,207,156	-	↗	
34	The ratio of subsidies and DP support to turnover	7	-	↘	
35	Number of staff per 1,000 connections	9	2	→	

1MK= 0.000577 USD

(3→4) Is the tariff revenue improvement leading to financial improvement?	
Diagnosis result	-The spiral is not working well. -While turnover is increased in 2023/24, almost all financial indicators remained negative, raising concerns about BWB's ability to sustain operations. - The O&M coverage ratio has been around 73% to 79% for last four years, leading to continuous net loss. The foreign currency denominated loan incurred exchange loss last two financial years, causing further deterioration of the loss before tax to 37 billion in FY2024. - Comparing to LWB, the electricity cost per sold water is significantly high. However, the other cost such as staff, and administrative costs are high as well. The number of staff per 1,000 connections is high. - These negative financial conditions are attributed to partly high NRW ratio (55%) and higher electricity cost.

5. Strategy analysis

Medium- to long-term direction of the water utility

1. VISION

"To be a dynamic, reliable, effective, efficient and good quality water supply and sanitation services provider."

2. MISSION STATEMENT

"To provide reliable and affordable water supply services to our customers whilst effectively contributing to the development of the national economy and sustainability of the environment"

3. Corporate values

- Professionalism and integrity, Teamwork and networking, Quality services, Transparency and accountability, Customer satisfaction, Conducive work environment

4. Malawi's National Water Policy (revised in 2023)

the policy priority area 2 of water supply and waterborne sanitation indicates the effective and efficient water supply management through the reduction of **NRW** in all supply areas of all the water boards in the country **at most to 25%**. Further, developing and building the capacity of personnel in water utilities through formal and information trainings is set as priority.

5. First 10-Year Implementation Plan (MIP-1, 2021-2030)

MIP-1 aims to reach 100 percent coverage by 2030 from 88.3 percent in 2020.

(iii) water sector investment plan (2012-2030) which targets full water supply coverage and at least 40 percent sanitation coverage by 2030.

6. The estimated water demand

It is projected to increase to 171,000 cubic metres per day by 2030 according to a 2012 Sogreah report. A related study done by Nicholas O'Dw year (2015) has also projected a demand of 220,000 cubic metres per day by 2040.

7. The 2020-2025 Strategic plan (The 11 strategic focus areas)

- i. Improve the reliability of water supply service.
- ii. Improve production, operations and data management.
- iii. Increase customers from 60,000 to 100,000 connections.
- iv. Improve customer satisfaction.
- v. Reduce NRW from 53% to 30%.
- vi. Ensure compliance to good governance principles and practices.
- vii. Reduce electricity costs through development of alternative power sources.
- viii. Promote corporate branding.
- ix. Improve finance.
- x. Improve staff productivity.
- xi. Restructure and improve facility management.

8. FINANCIAL RECOVERY AND SUSTAINABILITY PLAN (Aug 2024 to Jul 2025) for break even

- Revenue Enhancement
- Cost Reduction

9. TURNAROUND STRATEGY (2024-2027)

- a) To reduce non-revenue water from 62%/52% (March 2024) to 43% by March 2027.
- b) To improve staff productivity from 9 to 7 employees per 1,000 connections by March 2027.
- c) To improve sales volumes by 30% from monthly average of 1,200,000 m³ by March 2027.
- d) To reduce short term liabilities by 10% annually from MK39.3 billion.
- e) To reduce electricity bills by 40% from monthly average of MK2 billion by March 2027.

Suggestions for improvement

Overall Goal

"To ensure reliable, affordable, and sustainable water and sanitation services, for customer and supporting national economic growth."

This goal aligns with vision and mission of BWB.

Mid-term Goal:

"BWB transforms by implementing a well-developed turnaround strategy, primarily focusing on increasing water supply reliability while enhancing financial sustainability through improving operational efficiency"

Currently, the entire growth spiral is not working well. Financial indicators are mostly negative, exacerbated by high electricity costs. The revenue from water sales is negative to cover even basic operation and maintenance (O&M) costs, preventing BWB from achieving service improvements. To address these challenges, BWB has developed a turnaround strategy, with the following expected outcomes:

- Improved operational efficiency
- Improved financial position
- Improved staff productivity
- Improved corporate governance
- Improved water supply
- Improved customer service

A persistently high NRW rate remains a major challenge, driven by inadequate strategies and limited budgets. To tackle this, strengthening the capacity of the specialized NRW department, formulating targeted strategies, and addressing commercial losses are crucial.

High operating costs, particularly electricity expenses, also pose a significant burden. To alleviate financial strain, BWB plans to replace aged pipes, negotiate electricity cost reductions, and invest in solar power plants. The renewal of the Mudi Water Treatment Plant is expected to enhance water supply reliability.

Inefficient maintenance practices continue to be a critical issue. These can be addressed by developing comprehensive operation manuals and enhancing the training system to facilitate effective technical skill transfer. Furthermore, revisiting and updating the existing human resource development plan is essential to ensuring sustained and effective workforce capacity.

Given the current support provided to BWB by the World Bank, it is essential to explore opportunities for maximizing collective and sustainable impact.

Components of WB:

1. Water supply improvements
2. Priority Sanitation Investments
3. Institutional Capacity Strengthening
4. Technical Assistance and Project Management

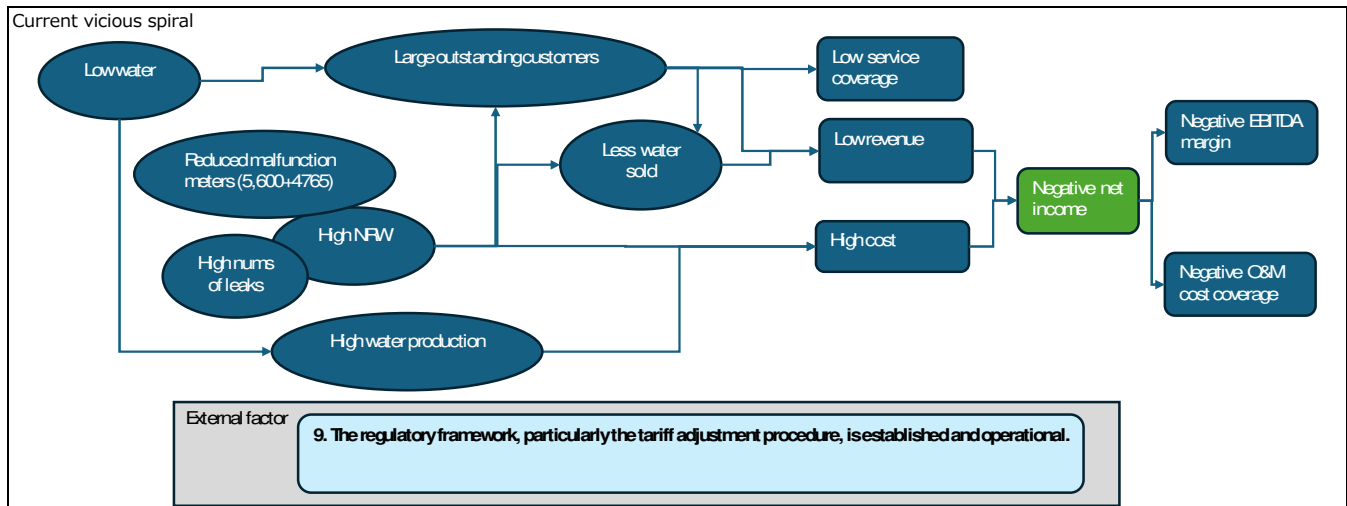
Performance- Based Contract (PBC)

PBC-1: Non-Revenue Water for Blantyre Water System (Percentage) 53->35

PBC-2: Working ratio (The ratio between operating expenses and gross revenues) for BWB (Number) 1.25->0.9

PBC-3: Staff per 1000 connections (Number) 12->8

PBC-4: Customer satisfaction index (Percentage) 44->70 *4



Recommendation for steps to make Growth Spiral work

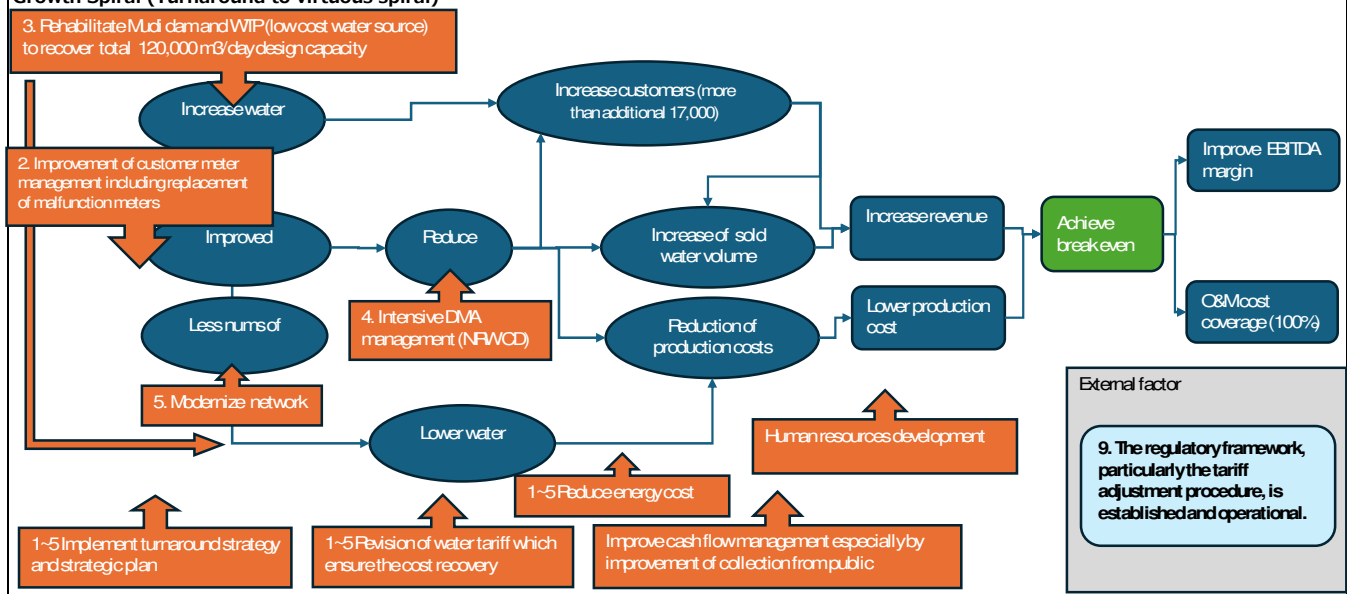
- 1~5 Implement turnaround strategy and strategic plan
2. Replace malfunction meters (Enhance NRW management capacity)
3. Rehabilitate Mudi dam and WTP (low cost water source) to recover total 120,000 design capacity (Improve water production capacity)
4. Intensive DMA management (Enhance NRW management capacity)
5. Modernize network
- 1~5 Reduce energy cost
- 1~5 Revision of water tariff which ensure the cost recovery

Break-even → Grow

Other improvement measures

- Improve cash flow management especially by improvement of collection from public institutions
- Human resources development and improvement of efficiency

Growth Spiral (Turnaround to virtuous spiral)



6. Potential Solutions

Goals

Overall Goal	To ensure reliable, affordable, and sustainable water and sanitation services, for customer and supporting national economic growth
Mid-term Goal	BWB transforms by implementing a well-developed turnaround strategy, primarily focusing on increasing water supply reliability while enhancing financial sustainability through improving operational efficiency

Outcomes

	Outcomes	Indicator	Target		
			Base line	2030	Long term
1	Achieve financial recovery by implement turnaround strategy and strategic plan	Achievement of important KPI			
2	Improve water production capacity	Water production volume per year			
3	Enhance NRW management capacity	NRW (%)	53	35	25
4	Modernize and renew water supply facilities (Network and WTP)				
5	Reduce energy cost	Energy cost to production cost (%)	31		
6	Improve cash flow management especially by improvement of collection from public institutions				
7	Revision of water tariff which ensure the cost recovery	O&M cost coverage ratio			
8	Human resources development and improvement of efficiency	Number of staff per connection Mobilized external funding			

External actions

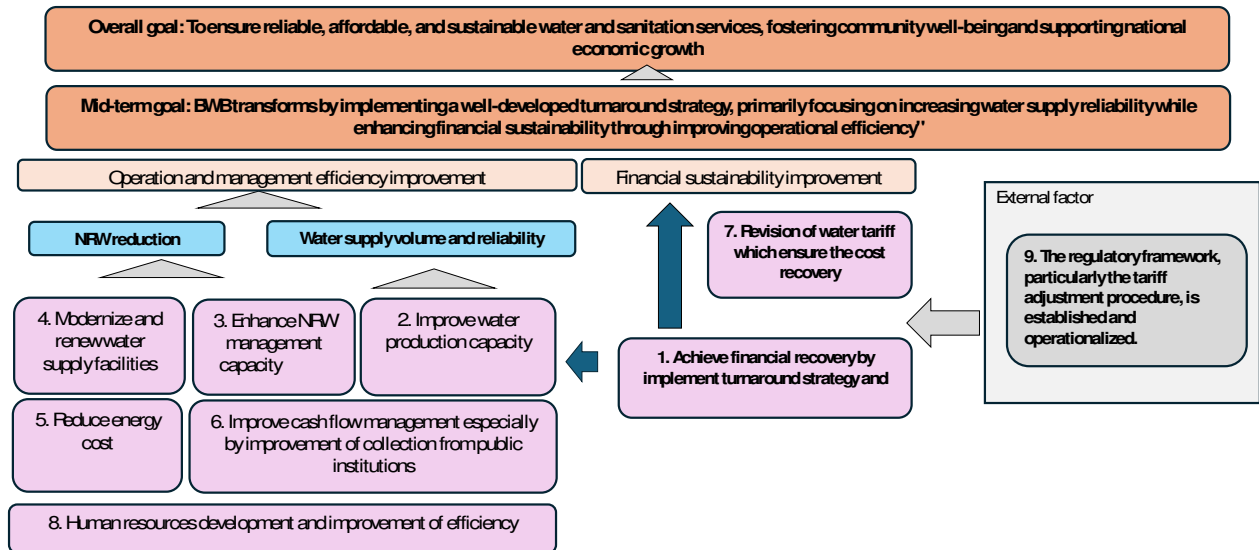
9	The regulatory framework, particularly the tariff adjustment procedure, is established and operationalized.				

Activities

Activities		DPs support	Target	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	Long-term
1	Achieve financial recovery by implement turnaround strategy and strategic plan									
	1 Assess BWB's implementation capacity for turnaround strategy and strategic plan		Urgent							
	2 Enhance capacity of planning, implementation, and monitoring for turnaround strategy	BWB can hire local consultant with support from WB	Medium							
	3 Enhance capacity of planning, implementation, and monitoring for strategic plan		Medium							
2	Improve water production capacity									
	1 Develop master plan for optimal water sources development	World bank's support for prioritization and identification	Urgent							
	2 Rehabilitation of dam , intake facility and treatment plant at Mudi system	Intake and treatment are covered by WB support	Medium							
	3 Rehabilitation of intake facility and existing treatment plant at Shire river		Medium							
	4 Development of new water sources and treatment plant, new transmission mains (Mombezi/ Mulanje)		Long							
3	Enhance NRW management capacity									
	1 Update NRW strategy and develop NRW management plan		Urgent							
	2 Strengthen NRW management capacity		Short							
	3 Implement NRW management plan		Medium							
4	Modernize and renew water supply facilities (Network and WTP)									
	1 Implement for priority projects in two zones	Ongoing with WB support	Short							
	2 Implement project for the zone which is not covered by Worldbank project		Medium							
	3 Develop introduction of SCADA and implement		Medium							
5	Reduce energy cost									
	1 Plan energy consumption reduction		Urgent							
	2 Optimize existing plant operation		Medium							
	3 Development of solar power plant for existing water treatments and pumping stations		Medium							
6	Improve cash flow management especially by improvement of collection from public institutions									
	1 Replacement of pre-paid meter for public intuitions		Urgent							
	2 Negotiation to settle the payment of arrears for public intuitions		Medium							
	3 Improve cash management		Medium							
7	Revision of water tariff which ensure the cost recovery									
	1 Develop a mid term financial plan for water tariff calculation		Urgent							
	2 Improve customer satisfaction by introduction of integrated management information system, including customer relationship management system		Medium							
	3 Execute tariff study for sustainable tariff model		Medium							
	4 Engage population and the ministry for tariff revision		Medium							
8	Human resources development and improvement of efficiency									

[illegible]

Scenario of Improvement



0. Benchmark

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Investment cost (Currency)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%	15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Aim for Public Company Accounting	—
Profitability		20	Net income (Currency)	—	—	—	—
		21	EBITDA (Currency)	—	—	—	—
		22	EBITDA margin (%)	Negative	20%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	20%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	8% or less	Aim for 10% or more	—
		26	Equity ratio (%)	Negative	30% or less	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (Currency)	—	—	—	—
		33	Development Partner grant support (Currency)	—	—	—	—
		34	The ratio of subsidies and DP support to turnover	—	—	—	—
Human resource efficiency		35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Les than 4.0

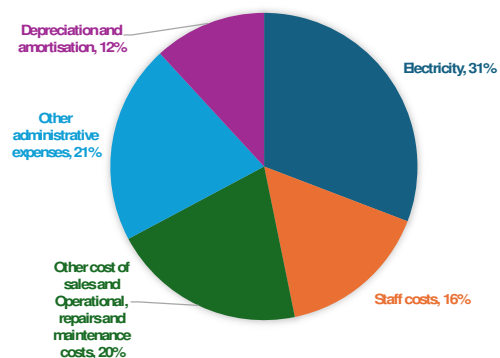
7. Preliminary Financial Comparison between LWB and BWB

	Item	Actual in BWB in 24/3	Actual in LWB in 24/3	Assumption: NRW 25%
KPIs		BWB in 24/3	LWB in 24/3	BWB in 24/3
	Production (m3/annual)	33,366,384	41,019,795	33,366,384
	Sold water (m3/annual)	14,209,659	24,413,797	25,024,788
	NRW ratio (%)	55	40	25
	Collection ratio (%)	49	95	
	Unit cost per m3 (Costs/sold water volume)	3,417	1,267	1,940
	Unit price per m3 (Revenue/sold water volume)	2,123	1,555	2,123
	Connections *1	71,974	134,338	
	Investment expenditure	6,096,597	42,632,508	
	Price of 6 M3 (local currency)	10,610	4,391	
	Staff number	625	635	
Revenue and costs (MK'000)		BWB in 24/3	LWB in 24/3	
	Revenue	30,160,723	37,959,605	53,116,384
	Costs (excl. finance cost and exchange loss)	(48,550,546)	(30,926,388)	(48,550,546)
	Electricity	(14,958,952)	(3,718,262)	(14,958,952)
	Staff costs	(7,750,195)	(9,891,626)	(7,750,195)
	Other cost of sales and Operational, repairs and maintenance costs *2	(9,911,495)	(8,809,435)	(9,911,495)
	Other administrative expenses *2	(10,179,683)	(7,380,334)	(10,179,683)
	Depreciation and amortisation	(5,750,221)	(1,126,731)	(5,750,221)
Cost components (%)		BWB in 24/3	LWB in 24/3	
	Electricity	31%	12%	
	Staff costs	16%	32%	
	Other cost of sales and Operational, repairs and maintenance costs	20%	28%	
	Other administrative expenses	21%	24%	
	Depreciation and amortisation	12%	4%	
Unit cost (MK/sold water m3) by item		BWB in 24/3	LWB in 24/3	BWB in 24/3 (25% NRW assumption)
	Electricity	1,053	152	598
	Staff costs	545	405	310
	Other cost of sales and Operational, repairs and maintenance costs	698	361	396
	Other administrative expenses	716	302	407
	Depreciation and amortisation	405	46	230
	Total	3,417	1,267	1,940
	Staff cost per connection	108	74	
	Staff cost per person per month	1,033	1,298	
	Investment per connection	85	317	

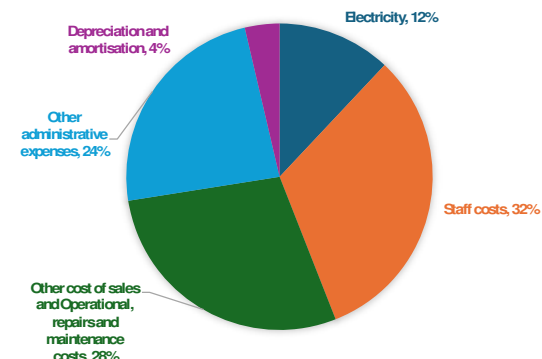
Note: *1 BWB is 2023, LWB is 2024.

Note: *2 These cost items are sorted and aggregated by JICA team as the both utilities are not same cost items in P/L statement.

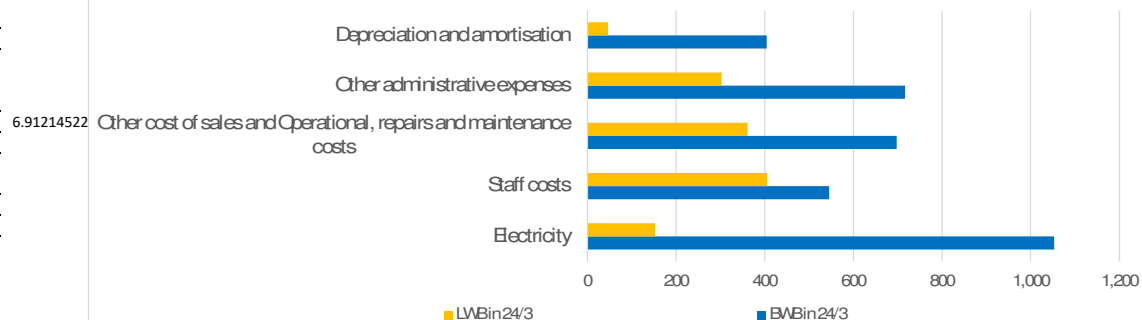
COST COMPONENTS (%) IN BWB IN 24/3



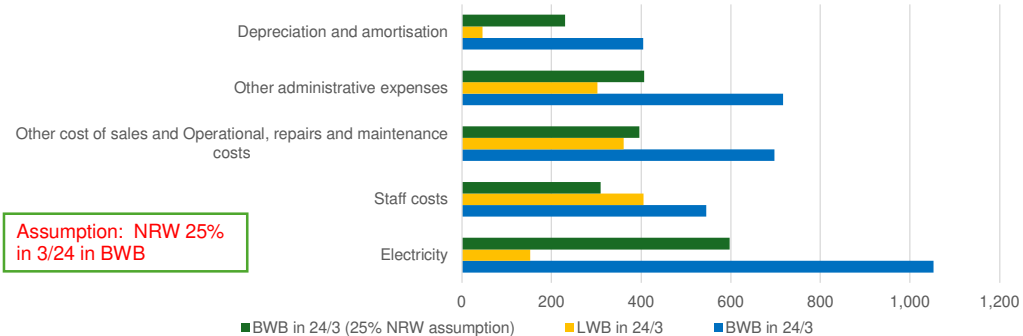
COST COMPONENTS (%) IN LWB 24/3



Actual unit cost by item and assumed NRW and Collection ratios (MK/sold water m3)



Actual unit cost by item ratios in BWB and LWB and unit cost in BWB with assumed NRW ratio (MK/sold water m3)



3a. Bottleneck analysis (details)

oundar	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
Internal Factors	1	Management and finance			
		Accounting consistency and transparency issues			
		Financial statements are made not on the accrual basis of accounting.	☒	☐	
		There is no fixed assets register for financial management	☒	☐	
		Low profitability			
		The water revenue is insufficient to recover O&M costs.	☐	☒	The poor financial performance resulting from low tariffs, high operating and administrative costs, and insufficient governance.*4 However the 90% tariff increase in 2023 might have improved the financial position.
		The water revenue is insufficient for full-cost recovery including investment cost	☐	☒	BWB's financial performance remains highly unstable, with working ratios above 1.4 over the past five years, representing a continuous decrease of equity and reserves.*4 Deficit is covered by bank overdraft and accounts payables. *9 The Working ratio for 2023 was 1.62. *9
		Unit price of water supply is low	☐	☒	The minimum tariff for domestic use is 1.015 USD/m3. This is high considering that the GDP per capita is 463 USD.
		Unit cost of water supply is high	☐	☒	Approximately 85% of the required water volume is supplied from the Walker's Ferry Water Treatment Plant (Shire River), which is located more than 40 km away from the city. The high electricity costs for pumping water from the low-altitude intake point to the city, which has an elevation difference of about 800 meters (GL400 m ⇒ GL1,200 m), cause a significant problem for the BWB.*3 The utility is experiencing financial and operational stress resulting from the technical complexities and high energy costs relating to high head pumping, with long rising mains and pipe aging, which combined, are leading to elevated operational costs and NRW.*4 Energy costs currently account for 46 percent of the total operating costs.*4 Currently, BWB cannot reduce water production and electricity costs for pumping at Walker's Ferry WTP. Consequently, electricity costs at Walker's Ferry WTP make up approximately 84.4% (about MWK 987 million) of total electricity costs. In order to reduce the entire electricity costs in the BWB water supply service, the significant reduction of electricity costs generated at Walker's Ferry WTP and Chilekela relay pumping station is indispensable.*3 The adoption of a special electricity tariff (off-peak rate) has been approved, effective September 2024. However, it is conditional upon timely payments. The plan aims to reduce electricity costs by 800 million MK per month, lowering expenses from USD 2.1 million to USD 1.2-1.3 million.
		Process for setting water tariff is not in place			
		Water tariff is not reviewed on a regular basis	☐	☒	Tariff have been reviewed and increased recent years. The tariff increased by average 29% in 2017. The tariff was not changed from two financial years from 2019 to 2020. The tariff increased by 90% in 2023. The tariff was increased in April 2024. The tariff increased by 10% in September 2024 There is no water tariff calculation model, and only the revenue requirement formula is in place. This situation has arisen due to the absence of a regulatory authority, highlighting the need for improvement. High inflation of approximately 34% has led to rising costs. However, suppliers are adjusting prices based on exchange rate fluctuations. A 30% water tariff increase was proposed, but the Ministry of Water approved only a 10% increase. The target for achieving break-even next year relies on reducing NRW. The Water Tariff Affordability Survey (conducted in November 2024) found that water tariffs are generally considered low. However, the lack of an independent regulatory body makes water tariff adjustments difficult.
		Water tariff is not revised in response to increases in operating costs such as inflation	☐	☒	Water tariff are revised periodically but not according to inflation. *9
		Insufficient planning and investment funding shortage			
		No business operation plan and facility development plan have been prepared.	☒	☐	The World Bank's project includes initiatives to improve governance and enhance KPIs. As part of the efforts for business restructuring, a Turnaround Strategy has been developed, which includes a Financial Recovery Plan. Under this plan, the goal is to achieve break-even in the next fiscal year. Furthermore, by the end of March 2029 (four years from now), the company aims to improve NRW and establish a financial structure capable of making investments. The most critical challenges remain NRW and electricity costs.
		No financial projection of short to long term funds	☐	☐	To increase revenue, efforts are being made to reduce NRW with support from the World Bank project. Reducing electricity costs is the most crucial factor in lowering O&M costs. Discussions have been held with ESCOM, the power utility company, to apply a special electricity tariff, and the response has been positive. Additionally, efforts are being made to reduce printing costs, travel expenses, and overtime pay, while also addressing illegal connections and meter improvements. Under this plan, NRW is expected to improve to 35% by 2030. Furthermore, achieving a working ratio of 0.9 is required. Meanwhile, the target of 9 staff per 1,000 connections has already been met.
		High reliance on external funding such as subsidies in multi-year business plans	☐	☐	Need to check
	2	Service provision and maintenance issues			
		The water supply coverage ratio and the population served are not growing.			
		The water supply coverage ratio and the population served are not growing.	☐	☒	Nearly 70 percent of the city's population lives in unplanned, informal settlements characterized by high poverty rates, overcrowding, poor road access, and limited access to basic services, such as electricity, water, and sanitation.*4 ->it seems difficult to develop pipelines based on plans and increase service coverage Currently, there are over 10,000 pending connection requests, but limited water supply capacity prevents further expansion. Increasing treated water production is essential.

oundar	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Insufficient infrastructure development			
		Water supply infrastructure capacity is insufficient (there is a gap between demand forecasts and facility capacity)	☐	☒	Walkers' Ferry (WF) on the Shire River is the city's main water source, accounting for 80 percent of the water supplied to Blantyre. The other 20 percent comes from the Mudi Dam and Likhubula River. The average water production (88,700 m ³ /d) only covers two-thirds of the current estimated demand. *4 low production and distribution infrastructure capacity*4 The Mudi Dam was constructed in 1955, 70 years ago, and has not been dredged since then. As a result, silt has accumulated at the bottom, reducing the dam's storage capacity. To restore its capacity, dredging and raising the embankment are necessary. However, due to the proximity of a railway, this is challenging. Raising the embankment would increase the water level, potentially submerging the upstream railway tracks. The intake tower has three intake levels (each spaced 5 meters apart), but due to sedimentation, the lowest intake is no longer visible. Last year had low rainfall. Normally, at this time of the year, the dam would still have half of its water storage (as of December 2024). The Mudi Water Treatment Plant was built in 1929 with a maximum production capacity of 45,000 m ³ /day (1,500,000 m ³ /year). However, its current output has decreased to 9,000 m ³ /day, and during the dry season, it further declines to 4,000 m ³ /day. This year, the water source dried up four months ago, forcing the plant to cease operations. Since last month, the rainy season has begun, and rainfall is anticipated. In addition to the decreasing water source, the plant's capacity itself has deteriorated, requiring rehabilitation. The filtration sand needs to be replaced annually, which is costly. The raw water turbidity is 200 NTU, which reduces to 5 NTU after sedimentation and below 1 NTU after filtration. The water treatment plant was originally intended to supply 40% of the total water volume, but its output has declined. The remaining supply comes from the Shire River (80,000–90,000 m ³ /day) and the Nguludi Water Treatment Plant (Likhubula River) at 20,000 m ³ /day. Currently, the distribution is 80% from the Shire River and 20% from Nguludi. The Shire River has high silt accumulation, deteriorating water quality. During the rainy season, the river carries excessive mud, making treatment impossible, requiring a temporary halt in supply. Turbidity can reach as high as 13,000 NTU. Although the total maximum supply capacity is 122,000 m ³ /day, the actual supply is 100,000–110,000 m ³ /day, while demand is 140,000 m ³ /day, resulting in a shortage. The current water supply duration varies by area, ranging from 16 to 18 hours per day. Frequent power outages during the rainy season further impact water distribution.
		Development of new facilities is not progressing	☒	☐	
		There is a lot of aging infrastructure	☐	☒	Replace asbestos cement pipes (AC) which were laid over 50 years ago to withstand water pressure fluctuation for the purpose of elimination of water loss.*3 WTPs, Pumping stations, and pipelines are becoming ageing.*3
		High non-revenue water (NRW) rate			
		Water balance not calculated	☐	☒	Meters are regularly inspected for performance and accuracy, and calibrated or replaced if necessary. Replace water meter at regular intervals as meters deteriorate over time and their measurement accuracy decreases. *9 The NRW target for FY2024/2025 is set at 50%. Due to measures taken with prepaid meters, NRW decreased to 49% in October 2023. The goal for FY2024/2025 is to achieve break-even, which is expected to be achievable through the replacement of prepaid meters.
		High commercial loss	☐	☒	It is confirmed that the water balance is calculated based on the IWA's definition. However, the basis of physical and commercial loss is not clarified. *3 2020 data: "Unbilled Authorized Consumption" 0.7% "Apparent Losses (Commercial Loss)" 66% "Real Losses (Physical Loss)" 33.3% *3 BWB is severely challenged by ongoing vandalism to its service infrastructure such as water meters and illegal connections by a large number of customers and water users. This is due to a number of factors including but not limited to weak daily management capacity by BWB and people's attitude to intentionally steal water. BWB needs to take swift action to educate water users on this issue.*3 Staff involved in water tariff work, including meter readers and payment supervisors, are not conscious about problems in the processes of meter reading and payments. The current situation is one in which just the billing process is overly executed, and staff are satisfied with that "only the tariff recovery rate is high". The cause of this was also brought into sharp relief in workshops organized by volunteer staff from YWWB in 2017 and 2018 where it was found that "there are no manuals" and that "training is insufficient." It is believed that it is urgent to establish a system in which there are highly accurate meter readings/ payments/ billing operations through preparation of meter reading and payment manuals and by improving training. *3 It was revealed through the fact findings work that even with the increase in the quantity of water supplied and the number of customers also expanded, water sales either remained stagnant or even shrank in other times due to deficiencies in water meter reading and billing management system. * 3 Prepaid meters were introduced in 2017, with an initial installation of only 5,000 units. At that time, NRW was 37%. In 2018, an additional 20,000 prepaid meters were installed. However, revenue decreased, prompting an investigation into the cause. It was found that public institutions were paying for less water than they actually consumed, leading to the assumption that prepaid meters were the cause. The main meters are mechanical, but the sensor-based components did not function properly, resulting in underreporting of water consumption. In the first half of the fiscal year (April–September 2024), faulty and old meters have been replaced to reduce commercial losses. A total of 32,000 prepaid meters were installed, of which 8,000 have been replaced, leaving 24,000 currently in
		There is no specialized department for managing non-revenue water.	☒	☒	The specialized department for managing NRW was established in 2019. *3 Adequate number of staff is not assigned to the NRW countermeasures section in terms of the number of planned personnel (10 out of the planned 27 staff)*3
		There is no plan to reduce non-revenue water, and no measures have been implemented.	☐	☒	It is vital that target NRW ratio is set out so that relevant plans of specific activities for NRW reduction and corresponding financial plans can be considered or designed. At present, no projects of NRW reduction have been committed to and the framework of the new NRW section of BWB has not been ready*3
		High leakage rate			
		Many leaks are caused by deterioration of water pipes	☐	☒	Replacement of asbestos cement pipes (AC) which were laid over 50 years ago is required to withstand water pressure fluctuation for the purpose of elimination of water loss.*3
		Leak detection is not being carried out systematically	☐	☒	Under the World Bank-funded pipeline replacement project, two zones have been selected as priority areas, focusing on replacing existing asbestos pipes and upsizing pipelines where necessary. Areas with high demand are being prioritized, and GIS mapping is available. The project is expected to start in FY2025/2026 and be completed by 2029, with work concentrated within DMAs. Within the 65 DMAs, there are 1 to 3 special plumbers per DMA, totalling 40 plumbers, supported by 15 motorcycles. Currently, there is only one excavator, which is out of service. As a result, excavation is carried out manually or through contracted services. To improve efficiency, each of the three zones should have its own excavator. The target NRW level for DMAs is set at below 30%. Initially, there were plans to outsource NRW management through a Performance-Based Contract (PBC). However, the Board decided that NRW reduction should be a continuous internal effort, requiring capacity building for staff. Limited NRW equipment is a major challenge, as only basic tools are available. Currently, leak detection is limited to surface leaks, while 2000 leak cases per month are reported.

foundat	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Water pressure distribution is not controlled	☐	☒	BWB has pre-established 131 DMAs, under 18 pressure zones, as part of their efforts to control pressures. However, the system still faces significant operational challenges due to inadequate configuration, pipe aging, and lack of pressure control instruments.*4 A preliminary assessment, based on the existing model and pressure zones, indicates an estimated 32 pressure-reducing valves (PRVs), 70 valves, 18 flow meters, and 6.6 km of pipe upgrade required to fully establish the pressure and leakage control system. *4 Water supply pressure is not adequate due to low water supply and network bottlenecks.*9
		Insufficient maintenance			
		There is no up-to-date facility inventory for facility O&M	☐	☒	Inadequate systems and tools to ensure efficient management of its administrative and operational needs*4 Water asset maintenance is primarily reactive. No inventory (ledger) of facility.*9
		Regular maintenance of equipment is not carried out	☐	☒	High operational inefficiencies driven by aging infrastructure, hydraulic bottlenecks, and lack of operational procedures *4 The Walker Ferry Water Treatment Plant is located 40 km from the city in a straight line. The elevation difference is 800 m, with a total head of 1,000 m. Water is pumped to the city using a two-stage pumping system, each stage providing 400 m of head. Constructed in 1964, the dam and hydropower plant were built simultaneously. The original intake depth was 12 m, but silt accumulation has caused frequent intake pump failures, occurring every 1–2 weeks. A dredging machine was previously available but was damaged by a hurricane. During the rainy season, turbidity reaches up to 3,000 NTU, requiring increased chemical use from the usual 2 drums/day to 8 drums/day during periods of high turbidity. With funding from EXIM Bank India, there are plans to relocate the intake 4 km upstream, which would enable a treatment capacity of 200,000 m³/day, sufficient to meet 2040 demand. The design has already been completed. Pump efficiency measurements are conducted monthly at this and other pumping stations, with recommendations provided based on the results. Declining pump efficiency is a major challenge, with some pumps operating at only 50% efficiency. The primary causes include insufficient maintenance resources and wear and tear of internal components.
		No budgeted maintenance plan	☐	☒	
		No DX implementation and low operational efficiency			
		There is no strategy for implementing digital transformation	☒	☐	
		Digital technologies are not used for services(e.g. SCADA, GIS, user-friendly payment methods, advanced customer databases, smart meters)	☐	☒	The Madzi App was introduced in 2023. This app has features to enable postpaid bill enquiry, prepaid token enquiry, complaint filing, fault reporting, tip-off anonymous, payment options, tariff structure and water notices. The need to maximize the utilization of GIS, sensor integration and SCADA systems is recognized.
	3	Commercial Operations			
		Low customer satisfaction			
		There is no regularly updated customer database (computer-maintained).	☒	☐	"BWB Strategic Plan 2020-2025" sets target of customer satisfaction to 80% in 2025 given the baseline of 35% in 2020 . The low baseline is supposed to stem from late billing, inaccuracy of metering and tariff calculation. Customer complaints are logged in customer service module and fault management system. *9
		There is no established process for handling complaints, or there are problems with handling complaints	☐	☒	Call centre for inquire was established in 2019. Top three complaints: Financial complaints, Engineering complaints, and Meter/Connection Complaints*9 Customer Satisfaction Survey Findings: The long response time for handling customer queries has been identified as a major issue. The faulty meter reporting system also faces challenges, as plumbers currently receive manual instructions for handling issues. Water Supply Challenges: Frequent power outages by ESCOM have disrupted water supply operations. Water shortages due to source depletion are another major issue, which cannot be immediately resolved. Customers need to be informed about these challenges and ongoing processes. Customer Communication and Engagement: Planned maintenance notifications are communicated via notices, WhatsApp groups, and radio broadcasts. As part of the Turnaround Strategy, a Customer Relationship Management (CRM) system is planned, integrating call centre operations and billing data. This will be a holistic system, including the reporting system. Customer query reports are prepared quarterly and submitted to the Board. Customer tours of water treatment plants have been conducted to enhance public understanding of the water supply system. These tours are held annually and have been conducted twice so far. Feedback from customers is needed to improve them. Customer Service Centres: There are currently six customer centres where payments are processed. Each centre has two customer officers and two cashiers. Two new centres are planned in newly expanded remote areas. With increased digitalization, high-quality services could be provided without the need for physical customer centres. However, customer centre staff lack knowledge about water system operations and issues, leading to inadequate responses to customer inquiries. Billing Issues: For prepaid meters, customers often do not fully understand the water tariff structure (tariff steps). For postpaid meters, customers only become aware of leaks when they receive their bills, leading to complaints. High bills remain the most common grievance. Operational Efficiency and Workforce Planning: Unlike LWB, which outsources some customer services, BWB handles everything internally, including meter reading services. There are plans to increase the number of connections while aiming for a workforce ratio of six staff per 1,000 connections.
		Low collection ratio			
		The water tariff collection process (including unpaid fees) is not effective/efficient	☐	☒	Under the Debt Collection Policy, accounts with unpaid bills for three months are disconnected. However, delayed payments by government institutions remain a significant issue. 38% of accounts receivable are from public institutions. To address this, prepaid meters are being installed. In 2023, negotiations were conducted with administrators of hospitals and other facilities. As a result of disconnections, there has been an increase in illegal connections and the use of private wells, which is impacting BWB's water sources. Additionally, unauthorized water sellers have emerged. Plan to improve the collection rate: •Enhance effective communication with customers on their bills •Mobilize disconnection staff – constantly remind them of their responsibility and targets to achieve. •Monitor the disconnection process to ensure that set target are met. •Resolving financial related complaints timely.
		The payment method is inconvenient for customers (customers have some complaints)	☒	☐	According to the Newsletter, BWB plans to increase pre-paid meter from post-paid meter. BWB started usage of pre-paid meter from 2017. Payment Methods: Money mobile payments, Bank, Online, Cash, Vendors (Filling Stations) *9 Prepaid meters have an issue with underreporting, as the mechanical and electronic components do not function properly together. Consequently, the measured values from the mechanical component are underreported when transferred to the electronic component.

foundat	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
	4	Organization and Human Resource Management Issues			
	Shortage of engineers and skills gap				
	There is a shortage of engineers with specialized knowledge	☐	☒	Human Resource Strategic Plan 2020-2025 was prepared in Jan. 2021.*3 With regard to facility/equipment rehabilitation, it was confirmed in this survey that the proposals and reports from development partners had not been studied in detail within BWB. It is necessary for the staff of BWB to strengthen the ability to judge plans and proposals with their own eyes rather than blindly accepting them, and to have the ability to discuss the necessity of proposals for BWB. To achieve this, BWB needs to improve the quality of their work as engineers. *3 A five-year human resource development plan is in place, but systematic staff training processes are needed. Currently, skills are developed through OJT (on-the-job training). Although skilled workers exist, there are no dedicated trainers. The lack of a structured training system remains a challenge, and a Pre-Employment Training Centre is required. The workforce is relatively young, making it crucial to train new staff to replace retirees. Currently, experienced retirees play a key role in maintenance, and without them, operations would struggle. Structured training programs are needed to prepare younger staff.	
	No skills and training strategy or plan	☐	☒	Based on the above-mentioned strategic plan, BWB formulated the training plans every fiscal year and has conducted various types of training (OFF-JT). However, BWB has been forced to cancel the training because of budget constraints. Unplanned training is given if requested by the local employees.*3	
	Regular training and development programs are not provided adequately.	☐	☒	It was confirmed through the Survey that, while a human resource development plan had been formulated, a manual for each work had not been prepared and the training system had been inadequate. New employees learn their work by following experienced employees doing their work, since there is no systematic training. *3 In addition, if employees gain and accumulate tacit knowledge rather than formal knowledge, this leads to a risk of the loss of technical skills that should have been inherited before experienced employees retire, etc., meaning that converting this tacit knowledge to formal knowledge is an urgent challenge. For having a countermeasure against this, there is a need to establish a human resources development system that has a series of cycles: the formulation of a range of operation manuals, passing down technical skills through training, and achievement evaluation by means of capacity assessment of employees. *3	
	Declining organizational efficiency				
	There is no annual evaluation and goal setting system for staff	☒	☐		
	Performance-based rewards and promotions are not implemented in the personnel system	☒	☐	It can be said that in this way BWB has created a system to give employees incentives, which are required for raising motivation.*3	
	No power to hire and fire staff (within the bounds of an agreed plan)	☒	☐		
	Lack of strategic management capabilities in the organization				
	Not setting and monitoring enough Key Performance Indicators	☐	☒	The "Strategic focus areas", "Strategies under each perspective" and "Key performance indicators" which are addressed during the planning period by year are given in the plan, "BWB STRATEGIC PLAN 2020-2025".*3 The annual evaluation and feedback cycle of PDCA is not functioned well. There are few challenges in the adoption of the improvement plan. *9	
	Specific targets and deadlines associated with each strategic objective are not clearly defined.	☐	☒	ditto	
	There are no tools, mechanisms or metrics to evaluate the success of the strategy.	☐	☒	ditto	
	Governance issues				
	Important decision-making processes are not clear and are not made in a collegial manner.	☐	☐		
	The division of responsibilities within the organization is not clear.	☐	☐		
External factors	5	Environment (Water Sources)			
	Depletion of water sources and deterioration of water quality				
	Water sources are unstable (there is no stable water source)	☐	☒	There is an elevation difference of 800 meters from the water source to the city, requiring numerous pumps to supply water to the city. Consequently, a power outage results in prolonged water supply interruptions. During our support for the BWB, the Yokohama Waterworks Bureau observed multiple instances of water supply interruptions. To address these frequent interruptions, in the fiscal year 2019, the Yokohama Waterworks Bureau donated two water tankers, which were due for replacement, to BWB. These tankers are useful for transporting water during outages.*2	
	Water sources are over-exploited (unsustainable)	☐	☒	There are plans to halt the use of private wells within the service area. However, significant challenges are anticipated in implementing this initiative. See below also.	
	Water sources are affected by pollution and climate change	☐	☒	The city is already facing water shortages, and these are expected to become severe over time with the increased intensity of climate-related events such as floods and droughts. Blantyre water supply is highly vulnerable to water shocks, with frequent water supply interruptions due to high sediment load, deteriorating water quality, and aging infrastructure. In February 2022, in the aftermath of Cyclone Ana, Blantyre residents were left without water for more than three days, as both sources at Shire and Mudi were loaded with sediments from the flooded waters, and part of the network was washed away with the floods.*4 The effects of tropical Cyclone Fredy which hit Blantyre City and most areas of the Southern Region of Malawi between February and March 2023. The cyclone caused extensive infrastructure damage, leading to widespread pipeline damage and destruction. The WTP of Walker's Ferry was completely stopped due to heavy siltation and debris because of heavy rainfall and flooding. Restoration of the damaged infrastructure required substantial capital investment due to the scale of destruction. This affected the financial performance in the reporting year. *10 The cyclones impacts the service areas. In addition to that, the cyclone caused electricity production loss by ESCOM, which led to water rationing in 2021*8. The World Bank (WB) provided financial support for cyclone-related expenses, including repairs for damaged pipes and free water distribution to affected residents. These measures contributed to an increase in NRW. There is a need for emergency response measures, and the Turnaround Strategy includes plans for building climate-resilient infrastructure. Additionally, O&M costs have increased as a result.	
	6 Government systems and politics				
	Tariff policy issues				
	No medium- to long-term basic policy for the country's water sector exists	☒	☐	From 2018 to 2020, tariff increases were not implemented due to elections.	
	The purpose of the subsidy is unclear	☐	☐		

oundar	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Hindering self-sustaining operations			
		Financial viability of operations is not pursued.	☐	☒	
		The scope of business responsibility of water utilities is unclear (including investment responsibility for projects that have difficulty in securing viability and subsidies to make up the operating loss for pro-poor projects etc).	☐	☐	To be checked
		Regulation of water utilities does not function properly	☐	☒	Several institutional development challenges, including (i) the lack of a water resources management strategy with a clear roadmap of reforms and investments to increase water availability, (ii) an outdated water and sanitation investment plan, lacking a comprehensive and inclusive set of interventions to close the coverage gap, (iii) inadequate investment planning and implementation capacity, (iv) limited sector financing, and (v) the lack of a regulatory body and accountability mechanisms that enable citizen engagement. The project, BWSP, will finance policy and planning instruments, including the feasibility assessments and engineering design of priority infrastructure investments for selected Boards, training, and equipment to enhance the sector coordination and technical support to the water boards. *4
		The utility does not have the power to make personnel decisions	☐	☐	
	7 Development Partner (DP) Support				
		DP Support Status			
		There is no continuous donor support targeting the impoverished population.	☐	☐	
		There is no continued donor support for capital investments (new and replacement) that are difficult to finance through own internal sources and/or borrowing by itself.	☒	☐	-Blantyre Water and Sanitation Project (BWSP) (WB, AfDB, India Exim Bank) The estimated cost of the project is US\$130 million and is expected to run from June 2023 to December 2028.*1 US\$150 million have been secured from India Exim Bank for a new water source and associated infrastructure on the Shire River and the construction of a new solar power plant. *4 Components: 1.Water supply improvements water production (motivated by the increase in flood frequency and breakdowns at the existing water treatment plant),network stabilization, leak reduction, renewable energy sources, and water network expansion to unserved areas Under the project, a permanent pressure and leakage control system will be installed. 2.Priority Sanitation Investments 3.Institutional Capacity Strengthening (i) addressing identified climate change risks and enhancing BWB's operational and financial efficiency, (ii) improving BCC's(Blantyre City Council) capacity to manage sanitation services (iii) supporting the water sector investment planning and policy development 4.Technical Assistance and Project Management This component will finance TA to support the project implementation unit (PIU) and the incremental operating costs for project management Performance- Based Contract (PBC) PBC-1:Non-Revenue Water for Blantyre Water System (Percentage) 53->35 PBC-2:Working ratio(The ratio between operating expenses and gross revenues) for BWB (Number)1.25->0.9 PBC-3:Staff per 1000 connections (Number)12->8 PBC-4:Customer satisfaction index (Percentage)44->70 *4 -CONSTRUCTION OF NEW WATER SOURCE ON SHIRE RIVER AND ASSOCIATED INFRASTRUCTURE-PHASE I (the EXIM Bank of India) This project will include construction of a new water intake on Shire River, a water treatment plant, pumping stations, water tanks and pipelines to meet the projected demand of 230,000 m3/d in 2040.*5,6
			☐	☐	The World Bank (WB) has been implementing a Performance-based Partnership Contract (PPC) from 2023 to 2024, with the following targets: - Reduction of NRW - Improvement of the working ratio - Increase in the customer satisfaction index - Increase in female representation in decision-making roles - Reduction in the number of staff per connection The project also includes procurement of materials, NRW vehicles, and meters. However, in the first year, most targets were not met, except for gender representation and staff reduction. As a result, the NRW target was removed, and a new energy efficiency indicator was introduced. Additionally, measures were taken to avoid penalties in contracts with ESCOM. The responsibility for achieving these targets lies with BWB. The Exim Bank-funded project has been on hold for two years due to debt restructuring. In the meantime, a new project proposal is being prepared to seek alternative donors. The 2019 Exim Bank-funded project for the Mgulundi Water Treatment Plant was completed. However, new projects related to alternative water sources and solar power under Exim Bank and WB funding have not progressed. There is no technical assistance (TA) from the World Bank. However, TA for operational efficiency is needed.
		No continued donor support for capacity development projects	☒	☐	The BWSP includes "Institutional and Capacity Strengthening" and is expected to improve the operational and financial efficiency of the BWB, etc. *4 One of the PBCs is related to the NRW ratio, and it is assumed that the NRW would decrease mainly due to the replacement of aging pipelines. It appears that the BWSP doesn't include technical assistance for NRW reduction measures such as the JICA technical assistance project for LWB.
	8 Socioeconomy				
		Socioeconomic Impact			
		Rapid changes in economic conditions that have a significant impact on profitability (cost increases, exchange rate fluctuations, etc.)	☒	☐	The inflation rate 34% in 2023 and 21.9% in 2024. The local currency was depreciated rapidly by 50% from 2022 to 2023.
		Social characteristics affecting water services (war, increase in refugees, land expropriation, etc.)	☐	☐	
		Lack of funds			
		No funding source that offers financing terms accessible to water utilities	☐	TRUE	The minimum lending rate by the Reserve Bank of Malawi is 24.9%.

Working ratio(The ratio between operating expenses and gross revenues)

oundai	No.	Checklist	Problem		Describe the specific problem (If yes)
			No	Yes	
		Source			
※	1	https://www.bwb.mw/WorldBankProjectOverview.php			
	2	https://www.city.yokohama.lg.jp/kurashi/sumai-kurashi/suido-			
	3	都市給水分野に係る情報収集・確認調査（QCBS）2022年2月			
	4	WB_WATER AND SANITATION PROJECT I(Feb2023)			
	5	https://www.bwb.mw/FutureProjects.php			
	6	https://www.bwb.mw/Downloads/general_procurement_notice_new_water_source_project_phase_i.pdf			
	7	https://www.rbm.mw/Statistics/BankRates			
	8	https://www.nyasatimes.com/blantyre-water-board-rationing-water-supply/			
	9	Answer of the Questionnaire on 3rd Dec. 2024			
	10	BWB Annual Report 2023			
	11				

0. Benchmark

Subcategories	Growth spiral	No.	Key Performance Indicators (KPIs)	Stage of growth			
				1	2	3	4
Service level	1. Service improvement and more investment	1	Invetsment cost (Currency)	—	—	—	—
		2	Production capacity (m ³ /day)	—	—	—	—
		3	Production (m ³ /day)	—	—	—	—
		4	Utilization ratio of production capacity (%)	—	—	—	—
		5	Continuity of Service (Hrs/day)	Less than 12h/d	12-24h/d	24h/d	—
		6	Quality of water supplied (Compliance rate: %)	Untreated/turbid. water	WQ compliance rate less than 80%	WQ compliance rate (80%-90%)	Compliance rate 90% or more
		7	Water supply pressure	Low water pressure	Instable	Stable and within standard values	—
		8	Leakage ratio (%)	—	—	—	—
Business scale	2. Increased customer base and satisfaction	9	Population served / connections				
		10	Service coverage / Water coverage (%)	Below 50%	50-80%	80% or more	95% or more
		11	Customer satisfaction (%)	Low (60% or less)	Moderate (60-80%)	High (80% or more)	—
		12	Water sold (m ³ /day)	—	—	—	—
		13	Water consumption per capita per day (L/c.a/day) (Water sold/service population)	—	—	—	—
Cost-effectiveness	3. Increased tariff revenue	14	Turnover				
		15	Collection ratio (%)	60% or less	60-90%	Aim for 100% (90-98)	98-100%
		16	Non-revenue water ratio(%)	40% or more	25-40%	Less than 25%	15%
		17	Metering ratio (%)	80% or less	80-95%	Aim for 100% (95-99)	99-100%
		18	Water tariff level (USD/6M3)	—	—	Aim for a level of sustainable investment	—
Prerequisites	4. Improved financial management	19	Accounting system	—	—	Aim for Public Company Accounting	—
Profitability		20	Net income (Currency)	—	—	—	—
		21	EBITDA (Currency)	—	—	—	—
		22	EBITDA margin (%)	Negative	20%-40%	Aim for 40% or more	—
		23	EBITDA margin excl. deferred income (%)	Negative	20%-40%	Aim for 40% or more	—
		24	Total capital operating margin (%)	—	—	—	—
Financial soundness		25	Operating Profit Margin(%)	Negative	8% or less	Aim for 10% or more	—
		26	Equity ratio (%)	Negative	30% or less	Aim for 40% or more	—
		27	Fixed long term conformity rate (%)	—	Above 100%	Aim for less 100%	—
		28	O&M cost coverage ratio (%)	Less than 100	100-130	Above 130	—
		29	O&M cost coverage ratio excluding subsidies (%)	Less than 100	100-130	Above 130	-
		30	Unit cost of water supply (Currency/m ³) (Overall cost including DEP/Water sold)	—	—	—	—
		31	Supply price (Currency/m ³) (Turnover from sales/ Water sold)	—	—	—	—
			Overall cost excluding depreciation expense	—	—	—	—
			Overall cost including depreciation expense	—	—	—	—
		32	Subsidies (Currency)	—	—	—	—
33		Development Partner grant support (Currency)	—	—	—	—	
34		The ratio of subsidies and DP support to turnover	—	—	—	—	
Human resource efficiency	35	Number of staff per 1,000 connections	11 or more	6.5-11	4.0-6.5	Les than 4.0	

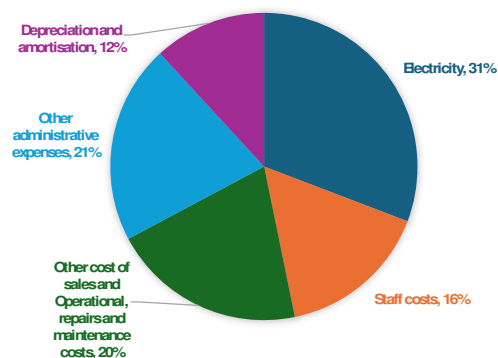
7. Preliminary Financial Comparison between LWB and BWB

	Item	Actual in BWB in 24/3	Actual in LWB in 24/3	Assumption: NRW 25%
KPIs		BWB in 24/3	LWB in 24/3	BWB in 24/3
	Production (m3/annual)	33,366,384	41,019,795	33,366,384
	Sold water (m3/annual)	14,209,659	24,413,797	25,024,788
	NRW ratio (%)	55	40	25
	Collection ratio (%)	49	95	
	Unit cost per m3 (Costs/sold water volume)	3,417	1,267	1,940
	Unit price per m3 (Revenue/sold water volume)	2,123	1,555	2,123
	Connections *1	71,974	134,338	
	Investment expenditure	6,096,597	42,632,508	
	Price of 6 M3 (local currency)	10,610	4,391	
	Staff number	625	635	
Revenue and costs (MK'000)		BWB in 24/3	LWB in 24/3	
	Revenue	30,160,723	37,959,605	53,116,384
	Costs (excl. finance cost and exchange loss)	(48,550,546)	(30,926,388)	(48,550,546)
	Electricity	(14,958,952)	(3,718,262)	(14,958,952)
	Staff costs	(7,750,195)	(9,891,626)	(7,750,195)
	Other cost of sales and Operational, repairs and maintenance costs *2	(9,911,495)	(8,809,435)	(9,911,495)
	Other administrative expenses *2	(10,179,683)	(7,380,334)	(10,179,683)
	Depreciation and amortisation	(5,750,221)	(1,126,731)	(5,750,221)
Cost components (%)		BWB in 24/3	LWB in 24/3	
	Electricity	31%	12%	
	Staff costs	16%	32%	
	Other cost of sales and Operational, repairs and maintenance costs	20%	28%	
	Other administrative expenses	21%	24%	
	Depreciation and amortisation	12%	4%	
Unit cost (MK/sold water m3) by item		BWB in 24/3	LWB in 24/3	BWB in 24/3 (25% NRW assumption)
	Electricity	1,053	152	598
	Staff costs	545	405	310
	Other cost of sales and Operational, repairs and maintenance costs	698	361	396
	Other administrative expenses	716	302	407
	Depreciation and amortisation	405	46	230
	Total	3,417	1,267	1,940
	Staff cost per connection	108	74	
	Staff cost per person per month	1,033	1,298	
	Investment per connection	85	317	

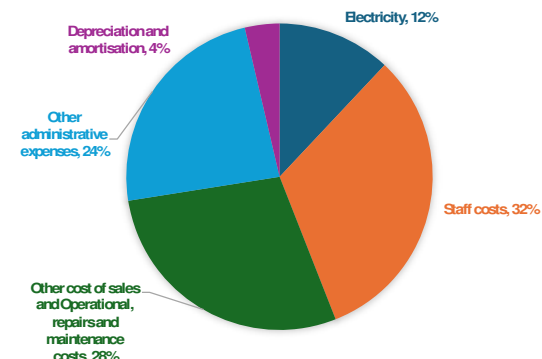
Note: *1 BWB is 2023, LWB is 2024.

Note: *2 These cost items are sorted and aggregated by JICA team as the both utilities are not same cost items in P/L statement.

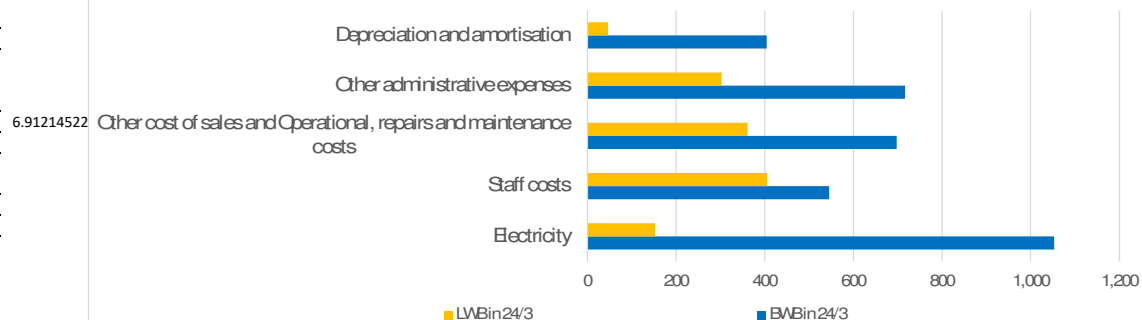
COST COMPONENTS (%) IN BWB IN 24/3



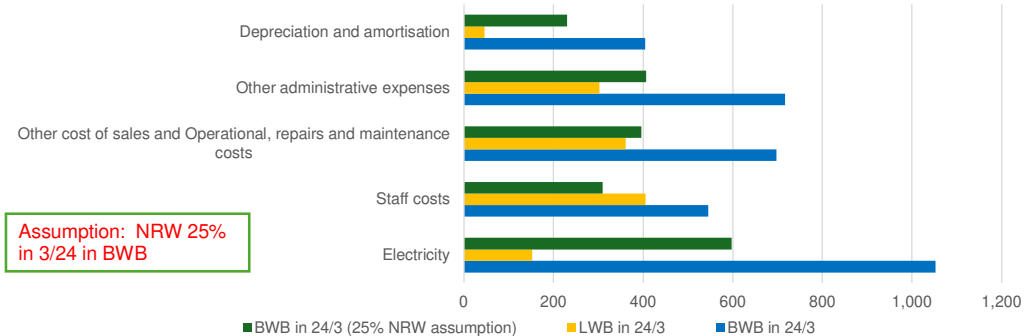
COST COMPONENTS (%) IN LWB 24/3



Actual unit cost by item and assumed NRW and Collection ratios (MK/sold water m3)



Actual unit cost by item ratios in BWB and LWB and unit cost in BWB with assumed NRW ratio (MK/sold water m3)



**STATEMENT OF PROFIT OR LOSS AND OTHER
COMPREHENSIVE INCOME**

*From here FY ends March

	Thousand	23/3	24/3	YoY(%)
Variable Variable/2	Revenue	23,704,485	30,160,723	27%
	- Water sales - post paid	17,080,246	22,248,647	30%
	- Water sales - pre-paid	5,596,509	6,810,804	22%
	- Other	1,027,730	1,101,272	7%
	Cost of sales	(17,202,872)	(18,153,626)	6%
	- Electricity	(14,229,470)	(14,958,952)	5%
	- Other	(2,973,402)	(3,194,674)	
	Gross profit	6,501,613	12,007,098	85%
	Other income	440,346	2,500,334	468%
	- Transfers from deferred income	187,447	150,083	-20%
	- Grant income	141,403	2,207,156	1461%
	- Other	111,496	143,095	
	Operational, repairs and maintenance costs	(4,957,823)	(6,716,821)	35%
	Administrative expenses	(16,685,082)	(23,680,099)	42%
	- Staff costs	(5,399,790)	(7,750,195)	44%
	- Depreciation and amortisation	(5,644,813)	(5,750,221)	2%
	- Impairment loss on trade receivables	(353,662)	(1,573,490)	345%
	- Motor vehicle expenses	(1,058,272)	(1,414,990)	34%
	- IDA Malawi water and sanitation	-	(2,101,710)	-
	- Other	(4,228,545)	(5,089,493)	20%
	Finance costs	(3,015,143)	(3,132,933)	4%
	Exchange loss	(5,253,791)	(18,078,094)	244%
	Loss before tax	(22,969,880)	(37,100,514)	62%
	Income tax	2,277,028	3,511,489	54%
	Loss for the year	(20,692,852)	(33,589,025)	62%
	Other comprehensive income	-	-	
	Surplus on revaluation	12,196,872	-	
	Realised gains on revaluation	-	(111,148)	
	Deferred tax on revalued assets	(5,240,330)	50,586	-101%
	Total comprehensive loss for the year	(13,736,310)	(33,649,587)	145%
source : BWB Financial Statements				
	Growth of Revenue	54%	27%	YoY(%)
	EBITDA	-14,309,924	-28,217,360	97%
	EBITDA margin	-59.3%	-86.4%	46%
	EBITDA margin excl. Deferred income	-60.2%	-99.9%	66%
	EBITDA excl. Exchange loss	-9,056,133	-10,139,266	12%
	EBITDA margin excl. Exchange loss	-37.5%	-31.0%	2.4%
	Total income	24,144,831	32,661,057	23.4%
	ROA ((Continuing operations-Expenses)/total asset)	-16.9%	-16.5%	-2%
	Operating profit margin (Profit Before Tax excl. financial cost/Total income)	-60.9%	-48.6%	-20%
	Overall cost excl. depreciation	-33,200,964	-42,800,325	29%
	Overall cost incl. depreciation	-38,845,777	-48,550,546	25%
	O&M coverage ratio excl. subsidies (%)	72%	71%	-2%
	O&M coverage ratio (%)	73%	76%	5%
	Unit Cost of Water Supply (Currency/m³)			#DIV/0!
	Subsidies (000')	0	0	#DIV/0!
	Development Partner grant support (000')	141,403	2,207,156	1461%
	The ratio of subsidies and DP support to turnover	1%	7%	1054%
	Impairment loss/ revenue	1%	5%	
	Number of staff	604	625	
	Staff cost per person per month	745	1,033	
	Staff cost per person per month (USD)		599	

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

Current NRW is 40.5% (Physical 30.0% and non-physical 10.5%)			
1	Reduced NRW is 25% (Physical loss 19% and non-physical loss 6%)		
2 Reduced non-physical loss volume turns to income			
3 Reduced physical loss volume turns to reduction of variable cost without selling available water volume from physical loss			
Financial benefits assuming reduction of NRW		23/3	24/3
		Composition of NRW	
Actual	Total production		
Actual	Total supply volume per annum	36,405,810	40,214,835
Actual	Water volume sold (Revenue water)	17,110,731	18,096,676
Actual	NRW volume	19,295,079	22,118,159
Actual	NRW ratio	53.0	55.0
Assumed	NRW ratio by physical loss	38.7	40.2
Assumed	NRW ratio by non-physical loss	14.3	14.9
Calculated	NRW by physical loss	14,085,408	16,146,256
Calculated	NRW by non-physical loss	5,209,671	5,971,903
Assumed	Target NRW ratio	25	25
Assumed	NRW ratio by physical loss	18	18
Assumed	NRW ratio by non-physical loss	7	7
Calculated	NRW by physical loss	6,644,060	7,339,207
Calculated	NRW by non-physical loss	2,457,392	2,714,501
Calculated	Water saved from NRW reduction by physical loss	7,441,347	8,807,049
Calculated	Water saved from NRW reduction by non-physical loss	2,752,279	3,257,402
Unit cost and unit tariff rate (MK/m3)			
Calculated	Unit cost (All expenses/sold water volume)	2,270	2,683
Calculated	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	1,940	2,365
Calculated	Unit variable cost -Variable costs/sold water volume	1,150	638
Calculated	Unit price - Water & sewerage income/sold water volume	1,385	1,667
Saved cost and increased sales (MK/annual)			
Calculated	Cost saved from NRW reduction by physical loss	8,559,482	5,619,477
Calculated	Revenue generated from NRW reduction by non-physical loss	3,812,892	5,428,930
Calculated	Total value of revenue increased and costs saved by NRW reduction	12,372,374	11,048,408
Total calculated income and expenditure (MK/annual)			
Calculated	Total Income	27,517,377	35,589,653
Calculated	Total expenditure before Depreciation	24,641,482	37,180,848
Calculated profits (MK/annual)			
Calculated	Operating Profit Before Depreciation	2,875,895	(1,591,194)
Calculated	Operating profits before finance costs	(2,768,918)	(7,341,415)
Calculated	Net (Loss) Profit Before Tax	(15,266,397)	(33,641,935)
Calculated	Profit (Loss) for the year		
Financial indicators assuming NRW reduction			
EBITDA		2,875,895	(1,591,194)
EBITDA Margin		10%	-4%
EBITDA Margin(excluding deferred income)		10%	-4%
ROA (Operating profit/asset)		0.1%	0.0%
Ordinary profit margin		-55%	-95%
O&M coverage ratio (excluding deferred income)		110%	89%
O&M coverage ratio(including all income)		112%	96%
Financial indicators (Original)			
EBITDA		(14,309,924)	(28,217,360)
EBITDA Margin		-59%	-86%
EBITDA Margin(excluding deferred income)		-60%	-100%
ROA (Operating profit/asset)		-17%	-17%
Ordinary profit margin		-61%	-49%
O&M coverage ratio (excluding deferred income)		72%	71%
O&M coverage ratio(including all income)		73%	76%

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Loss for the year	(20,692,852)	(33,589,025)	62%
Other comprehensive income	-	-	
Surplus on revaluation	12,196,872	-	
Realised gains on revaluation	-	(111,148)	
Deferred tax on revalued assets	(5,240,330)	50,586	-101%
Total comprehensive loss for the year	(13,736,310)	(33,649,587)	145%

source : BWB Financial Statements

			YoY(%)
Growth of Revenue	54%	27%	
EBITDA	-14,309,924	-28,217,360	97%
EBITDA margin	-59.3%	-86.4%	46%
EBITDA margin excl. Deferred income	-60.2%	-99.9%	66%
EBITDA excl. Exchange loss	-9,056,133	-10,139,266	12%
EBITDA margin excl. Exchange loss	-37.5%	-31.0%	2.4%
Total income	24,144,831	32,661,057	23.4%
ROA ((Continuing operations-Expenses)/total asset)	-16.9%	-16.5%	-2%
Operating profit margin (Profit Before Tax excl. financial cost/Total income)	-60.9%	-48.6%	-20%
Overall cost excl. depreciation	-33,200,964	-42,800,325	29%
Overall cost incl. depreciation	-38,845,777	-48,550,546	25%
O&M coverage ratio excl. subsidies (%)	72%	71%	-2%
O&M coverage ratio (%)	73%	76%	5%
Unit Cost of Water Supply (Currency/m³)			#DIV/0!
Subsidies (000')	0	0	#DIV/0!
Development Partner grant support (000')	141,403	2,207,156	1461%
The ratio of subsidies and DP support to turnover	1%	7%	1054%
Impairment loss/ revenue	1%	5%	
Number of staff	604	625	
Staff cost per person per month	745	1,033	
Staff cost per person per month (USD)		599	

Assumption of benefits of NRW reduction (NRW reduction benefit- Case 1)

1	Current NRW is 55% (Physical 40.2% and non-physical 14.9%) Reduced NRW is 25% (Physical loss 18% and non-physical loss 7%)
2	Reducing both physical and non-physical water losses leads to increased revenue.

Financial benefits assuming reduction of NRW		23/3	24/3	Composition of NRW
Actual	Total production			
Actual	Total supply volume per annum	36,405,810	40,214,835	
Actual	Water volume sold (Revenue water)	17,110,731	18,096,676	
Actual	NRW volume	19,295,079	22,118,159	
Actual	NRW ratio	53.0	55.0	
Assumed	NRW ratio by physical loss	38.7	40.2	0.73 LWB
Assumed	NRW ratio by non-physical loss	14.3	14.9	0.27 LWB
Calculated	NRW by physical loss	14,085,408	16,146,256	
Calculated	NRW by non-physical loss	5,209,671	5,971,903	
Assumed	Target NRW ratio	25	25	
Assumed	NRW ratio by physical loss	18	18	0.73
Assumed	NRW ratio by non-physical loss	7	7	0.27
Calculated	NRW by physical loss	6,644,060	7,339,207	
Calculated	NRW by non-physical loss	2,457,392	2,714,501	
Calculated	Water saved from NRW reduction by physical loss	7,441,347	8,807,049	
Calculated	Water saved from NRW reduction by non-physical loss	2,752,279	3,257,402	
Unit cost and unit tariff rate (MK/m3)				
Calculated	Unit cost (All expenses/sold water volume)	2,270	2,683	
Calculated	Unit cost excluding depreciation and financial costs (Expenses excluding dep. and fin. costs/sold water volume)	1,940	2,365	
Calculated	Unit variable cost -Variable costs/sold water volume	1,150	638	
Calculated	Unit price - Water & sewerage income/sold water volume	1,385	1,667	
Saved cost and increased sales (MK/annual)				
Calculated	Revenue generated from NRW reduction by physical loss	10,308,929	14,678,219	
Calculated	Revenue generated from NRW reduction by non-physical loss	3,812,892	5,428,930	
Calculated	Total value of revenue increased and costs saved by NRW reduction	14,121,821	20,107,149	
Total calculated income and expenditure (MK/annual)				
Calculated	Total Income	27,517,377	35,589,653	
Calculated	Total expenditure before Depreciation	22,892,035	28,122,106	
Calculated profits (MK/annual)				
Calculated	Operating Profit Before Depreciation	4,625,342	7,467,547	
Calculated	Operating profits before finance costs	(1,019,471)	1,717,326	
Calculated	Net (Loss) Profit Before Tax	(13,516,950)	(24,583,194)	
Calculated	Profit (Loss) for the year			
Financial indicators assuming NRW reduction				
EBITDA		4,625,342	7,467,547	
EBITDA Margin		17%	21%	
EBITDA Margin(excluding deferred income)		17%	21%	
ROA (Operating profit/asset)		0.1%	0.2%	
Ordinary profit margin		-49%	-69%	
O&M coverage ratio (excluding deferred income)		118%	118%	
O&M coverage ratio(including all income)		120%	127%	
Financial indicators (Original)				
EBITDA		(14,309,924)	(28,217,360)	
EBITDA Margin		-59%	-86%	
EBITDA Margin(excluding deferred income)		-60%	-100%	
ROA (Operating profit/asset)		-17%	-17%	
Ordinary profit margin		-61%	-49%	
O&M coverage ratio (excluding deferred income)		72%	71%	
O&M coverage ratio(including all income)		73%	76%	