



**PERFORMANCE BENCHMARKING GUIDELINES FOR WATER SUPPLY
AND SANITATION AUTHORITIES**

June 2018

FOREWORD

In year 2014, EWURA issued Performance Benchmarking Guidelines for Water Supply and Sanitation Authorities (WSSAs). The objective of the Guidelines was to detail and clarify how EWURA benchmark and compare the performance of WSSAs. The Guidelines were issued pursuant to Section (28)(2)(a) of the Water Supply and Sanitation Act, 2009 which obliges EWURA to prepare an annual report which include comparative analysis of the performance of regulated water utilities.

Over the past four years, benchmarking of WSSAs has been following the Guidelines and EWURA has been ranking the performance of WSSAs based on the same. Based on experience in application of the 2014 Guidelines, comments from stakeholders and developments in provision of water and sanitation services; EWURA learnt that some sections in the Guidelines required to be reviewed so as to enhance performance improvement in water supply and sanitation services.

In view of the above, the Performance Benchmarking Guidelines for Water Supply and Sanitation Authorities (2018) have been prepared. The 2018 Guidelines have included various improvements in performance benchmarking of WSSA including the procedure for ranking National Project WSSAs, improvements in evaluating data reliability and accuracy, taking into account compliance to regulatory obligations and performance comparison of all WSSAs in provision of sanitation services.

It is expected that WSSAs will appropriately utilize the guidelines to evaluate their performance in comparison to their peers, standards and best practices; and ultimately take appropriate steps for improvement. On the other hand, it is expected that the use of these Guidelines will foster the improvement in water supply and sanitation services in Tanzania.

Finally, I would like to thank all stakeholders for their valuable inputs in preparing these Guidelines. I am looking forward for your continued cooperation in improving provision of water and sanitation service.



Nzinyangwa Mchany
Acting Director General

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ABBREVIATIONS AND ACRONYMS

BOD	= Biochemical Oxygen Demand
COD	= Chemical Oxygen Demand
CRR	= Compliance to Regulatory Requirements
DT	= District and Townships
ESAWAS	= Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators
EWURA	= Energy and Water Utilities Regulatory Authority
MaJIs	= Web Based Water Utilities Information System
O&M	= Operation and Maintenance
NP	= National Project
KPI	= Key Performance Indicator
WSSA	= Water Supply and Sanitation Authority

1. INTRODUCTION

The Water Supply and Sanitation Act Cap 272, DAWASA Act Cap 273 and the Energy and Water Utilities Regulatory Act Cap 414 oblige EWURA (the Authority) to monitor the performance of Water Supply and Sanitation Authorities (WSSAs). Furthermore, Section (28) (2)(a) of the Water Supply and Sanitation Act Cap 272 obliges the Authority to prepare reports on comparative analysis of the performance of licensees in relation to performance targets specified in the licenses.

Performance Benchmarking has been adopted by the Authority as one of the tools for monitoring the performance of WSSAs. Benchmarking (comparative analysis) can be defined as: *“A systematic process of searching for best practices, innovative ideas, and effective operating procedures that lead to superior performance and then adapting those practices, ideas, and procedures to improve the performance of one’s own organization”*¹. Benchmarking seeks to identify standards or best practices to apply in measuring and improving performance.

Benchmarking enables utilities to identify the following:

- (i) what they are doing;
- (ii) how they are doing it;
- (iii) how others do it;
- (iv) how well they are doing it with reference to standards and best practices/performance; and
- (v) what and how to improve.

This Performance Benchmarking Guideline provides details and clarifications on how EWURA will benchmark and compare the performance of WSSAs. It includes a detailed description of the performance benchmarking approach, key performance indicators and targets, collection and validation of data and information, comparative analysis and dissemination and disclosure.

2. PERFORMANCE BENCHMARKING PROCESS

The process of performance benchmarking involves continuous actions aimed at performance improvement. It has to be noted that the overall objective of the benchmarking process is to trigger implementation of appropriate actions that will enable a WSSA to improve its current performance.

Performance benchmarking process starts by identification of key performance indicators and setting of performance level targets. Performance benchmarking is implemented annually using the following five steps:

- i. data collection and validation;
- ii. data analysis and evaluation;
- iii. discussion of draft data and information with WSSAs;

¹ American Water Works Association - AWWA (2005), Water Utility Management – Manual of Water Supply Practices(M5)

- iv. writing of Water Utilities Performance Review Report; and
- v. dissemination and disclosure of Performance Report.

3. PERFORMANCE INDICATORS

WSSA's performance is evaluated using performance indicators. *Performance indicators are measures of efficiency and effectiveness of the delivery of services by an undertaking that result from a combination of several variables*². A Performance indicator consists of a value which is a ratio between variables expressed in specific units. Performance indicators can be analyzed interpreted and compared by taking into consideration context information and the quality of data for each utility. For example, collection efficiency is a ratio of two variables such as revenue collected and amount billed.

3.1 CATEGORIZATION OF PERFORMANCE INDICATORS

Performance indicators are categorized into the following three groups: -

(i) Protection of the user interests

The purpose of this group of indicators is to assess to which degree the user interests are protected, as far as the service accessibility and the service quality are concerned.

(ii) Sustainability of the operator

The purpose of this group of indicators is to assess the degree of sustainability of the WSSA under the economic and financial, infrastructure, operational and human resources point of view.

(iii) Environmental sustainability

The purpose of this group of indicators is to assess to which degree the environmental aspects associated with the WSSA's activities are being considered.

3.2 KEY PERFORMANCE INDICATORS

There are many performance indicators that are used by WSSAs to monitor the achievement of their activities and objectives as stipulated in the Business Planning Guidelines. However, only key performance indicators which address overall performance and common objectives of WSSAs, have been selected for use in the benchmarking process. Key Performance Indicators have been assigned Acceptable Boundaries and Service Level Benchmarks based on best practice for each of the specified indicators within the African Region (For example the Regional Benchmarking of Large Water Supply and Sanitation Utilities 2015/2016 Report by ESAWAS), water supply and sanitation service targets set in the National Five Year Development Plan (2016/17-2020/21) and Water Supply Regulations GN.90, 2013.

² Enrique Cabrea Jr, Peter dane, Scott Haskins and Heimo Theuretzbacher - Fritz (2011), Benchmarking of Water Services, IWA Publishing, London, UK

The Key Performance Indicators are presented in Table 1 and are defined in Appendix 1.

Table 1: Key Performance Indicators

Indicator No.	Performance Indicators	Acceptable Boundaries			Service Level Benchmark
		Regional	NP	DT	
Protection of the User Interests					
User service accessibility					
KPI 1	Proportion of population served with water (%)	75%-85%	NA	75%-85%	100%
KPI 11	Proportion of population receiving WSSAs regulated sanitation services (%)	40%-50%	NA	40%-50%	100%
KPI 2	Average hours of supply (hrs.)	15-20	15-20	15-20	24
Quality of service supplied to users					
KPI 3	Water quality compliance				
	E-Coli	100%	100%	100%	100%
	Turbidity	95%-98%	95%-98%	95%-98%	100%
Sustainability of the Operator					
Operator's financial and economic sustainability					
KPI 4	Metering ratio (%)	85%-95%	85%-95%	85%-95%	100%
KPI 5	Non-Revenue Water – NRW (%)	25%-20%	25%-20%	25%-20%	<20%
KPI 6	Revenue collection efficiency (%)	90%-95%	90%-95%	90%-95%	>95%
KPI 7	Working ratio (ratio)	NA	NA	1.0- 0.8	<0.67
KPI 8	Operating ratio (ratio)	1.0-0.8	1.0-0.8	NA	<0.8
Operator's human resource Efficiency					
KPI 9	Personnel/1000	8-5	NA	8-5	<5

Indicator No.	Performance Indicators	Acceptable Boundaries			Service Level Benchmark
		Regional	NP	DT	
	(W&S) connections (ratio)				
KPI 12	Percentage of staff employed by WSSA	NA	70%-80%	70%-80%	100%
Environmental sustainability					
KPI 10	Wastewater quality compliance - COD and BOD ₅ (%)	95%-98%	NA	NA	100%

4. SETTING AND REVIEW OF KEY PERFORMANCE INDICATOR TARGETS

Key Performance Indicator Targets are set and reviewed in the WSSA's Business Plan in accordance with the Business Planning Guidelines issued by EWURA. The Business Plan indicates how the WSSA intends to reach the proposed Targets. Key Performance Indicator Targets are revised every three years in tandem with the review of the Business Plan. Earlier revisions can be conducted, if the WSSA makes a credible case for such a need which will also include a review of the Business Plan.

WSSAs need to work towards achieving set targets and as they improve in performance, they should finally work towards achieving Service Level Benchmarks. While the benchmark values for some indicators may initially appear unrealistic, they need to be recognized and internalized as the performance levels that service providers need to achieve in due course of time.

5. COLLECTION AND VALIDATION OF DATA AND INFORMATION

5.1 Data Collection

- (a) According to the Water Supply and Sanitation Rules, 2011, submission of data and information by WSSAs to the Authority is made through the following reports;
 - i. monthly operational reports in accordance with Water Utilities Information System (MaJIs) or any other system established by the Authority latest by 14th of the following month;
 - ii. draft annual reports prepared in accordance with the format established by the Authority detailing activities and operations of the WSSAs during the year, to be submitted not later than three months after the closure of

the financial year. It shall be accompanied by draft financial statements; and

- iii. final annual report prepared in accordance with the format established by the Authority detailing activities and operations of the WSSAs during the year, to be submitted not later than six months after the closure of the financial year. It shall be accompanied by a copy of the audited accounts together with the auditor's report and replies thereto.

(b) Draft and final annual reports shall also include a Performance Score Card in a format as shown in Appendix 2. The Performance Score Card consists of:

- i. key performance indicators;
- ii. input data and confidence grading in terms of reliability and accuracy;
- iii. actual achievement of the performance;
- iv. targeted performance levels; and
- v. a brief plan of actions for improving data reliability and accuracy.

(c) The data and performance indicators will be validated by:

- i. comparing aggregated monthly data and performance indicators from MajIs with annual report data;
- ii. comparing aggregated data from quarterly reports versus the data reported on the Performance Score Card;
- iii. comparing with data and performance indicators from previous years; and
- iv. ascertaining incoherent data by means of site visits or audits.

(d) WSSAs are also required to submit their business plans, customer service charters and water quality monitoring plans in accordance with respective Guidelines issued by EWURA.

5.2 Data Quality

Data quality is measured in terms of reliability of the source and the accuracy of the data (confidence grading). WSSAs shall indicate the quality of each of the variable which constitute a key performance indicator as shown in the performance score card (Appendix 2).

5.2.1 Data Reliability

The reliability of the source of data accounts for uncertainties in how reliable the source of data may be, such as the extent to which data source yields consistent, stable, and uniform results over repeated observations or measurements under the same conditions each time. Reliability of the data will be analysed as shown in Table 2.

Table 2: Data Reliability Bands

Reliability Bands		Definition
A	Reliable	Data based on sound records, procedures, investigations or analyses that are properly documented and recognized as the best available assessment methods
B	Fairly reliable	Data based on records, procedures, investigations or analyses that are properly documented and recognized as the best available assessment methods. However, up to 30% of the data is based on extrapolation.
C	Unreliable	Data based on extrapolation from records that cover more than 30 percent of the service provider's system.

5.2.2 Data Accuracy

The accuracy accounts for measurement errors in the acquisition of input data, i.e. the closeness of observations, computations or estimates to the true value. Accuracy of the data will be analysed as shown in Table 3.

Table 3: Data Accuracy Bands

Accuracy Band	Associated uncertainty
1	(0 – 5%): Better than or equal to +/- 5%
2	(5 – 20%): Worse than $\pm 5\%$, but better than or equal to + / -20%
3	>20%

5.2.3 Confidence Grading

Confidence grades can only be estimated directly for the variables. Based on these, Performance Indicators confidence grades can either be assessed quantitatively or qualitatively. Data source reliability and data accuracy should be assessed for every input variable. The overall confidence grade of the indicator will be the minimum of the confidence of the any of the constituting variables. For example, Non-Revenue Water (NRW) is computed from two variables namely water production (input into the distribution network) and billed volume (water consumption). If water production is measured with an estimated uncertainty of $\pm 15\%$ and from a reliable source will have a **confidence grade** of **A2** and if billed volume is measured from a fairly reliable source with estimated uncertainty of ± 15 will have a confidence grade of B2. Therefore, the overall confidence grade for NRW will be B2. WSSAs should aim for a grade of at least **B2**.

6. COMPARATIVE ANALYSIS

The essence of the benchmarking process is to provide organizations with the ability to compare their performance in relation to similar organizations or similar processes. The comparative analysis will ultimately rank performance levels for individual indicators both numerically and graphically. Comparative analysis will involve the following steps:

6.1 Performance Clusters

EWURA will evaluate the performance of WSSAs according to their categories which are Regional, National Project and District and Township. There shall be Performance comparison for all utilities using both water supply and sanitation indicators. In addition, the performance report will be issued in two volumes; volume one for Regional and National Project and volume two for District and Township WSSAs.

6.2 Performance Indicator's weights

The key performance indicators are assigned weights depending on the overall importance of the indicator to utility performance, customer focus, and level of resources committed by the utility in increasing efficiency and/or improving quality of service. Weights have been assigned to Key Performance Indicators as shown on Table 4.

Table 4: Key Performance Indicator Weights

Indicator No.	Performance Indicators	Weight		
		Regional	NP	DT
KPI 1	Proportion of population served with water (%)	9%	NA	9%
KPI 2	Average hours of supply (hrs.)	9%	12%	9%
KPI 3	Water quality compliance			
	E-Coli	14%	18%	14%
	Turbidity	9%	12%	9%
KPI 4	Metering ratio (%)	9%	12%	9%
KPI 5	Non-Revenue Water – NRW (%)	9%	12%	9%
KPI 6	Revenue collection efficiency (%)	14%	18%	14%
KPI 7	Working ratio (ratio)	NA	NA	5%
KPI 8	Operating ratio (ratio)	5%	6%	NA
KPI 9	Personnel/1000 (W&S) connections (ratio)	5%	NA	5%
KPI 10	Wastewater quality compliance -COD and BOD (%)	9%	NA	NA
KPI 11	Proportion of population receiving WSSAs regulated sanitation services (%)	8%	NA	8%
KPI 12	Percentage of staff employed by WSSA	NA	10%	9%

6.3 Data Analysis

Data analysis involves calculation of key performance indicators and comparing performances of WSSAs both for the current year and for the past three years. WSSAs will also be evaluated on the extent to which they have achieved their performance targets and complied to regulatory requirements. Performance comparison is done by using tables, graphs and charts. Performance trends and differences are then determined and explained.

6.4 Scores and Ranking

Ranking of the performance of WSSAs will be two fold, that is firstly overall ranking; and secondly ranking based on the attainment of performance targets and compliance to regulatory requirements (herein referred as utility ranking). Overall ranking intends to gauge the overall performance of WSSAs by taking into consideration individual efforts as well as external factors such as financing from the government and development partners. The output of overall ranking is identification of the overall best performing WSSA. On the other hand, utility ranking intends to rank WSSAs based on their individual efforts towards attainment of performance targets set in their Business Plans. Therefore, utility ranking intends to compare the performance of WSSAs by eliminating external factors that impacts individual performance of WSSAs. The details on how the two types of ranking will be implemented are provided below.

6.4.1 Overall Ranking

In obtaining the score for overall ranking EWURA considers two type of scores which are utility indicator performance score and compliance to regulatory requirement score. The utility indicator performance score accounts for 70% and compliance to regulatory requirement is 30% of the total performance score. The total performance score of a WSSA will be computed as a sum of the performance score for each indicator and the compliance to regulatory requirement score as follows:

$$\text{Total Performance Score} = 70\% \times \sum_{i=1}^n PS_{X,i} + 30\% \times \text{CRR score}$$

where

n = the total number of key performance indicators used for ranking,
 CRR = Compliance to Regulatory requirements, and
 $PS_{X,i}$ = Performance Score for utility X in Indicator i

Details on the calculation of performance score and compliance to regulatory requirement score are as described below.

6.4.1.1 Performance Score for each Indicator (PS)

Performance score for each performance indicator is calculated as a summation of scores based of best performer, attainment of performance target, confidence grading and attainment of service level benchmarks multiplied by the respective indicator weighting as described below:

$$PS_{X,i} = W_i x (SBP + SPT + SCG + SSLB)$$

Where

- $PS_{X,i}$ = Performance Score for utility X in Indicator i
- W_i = Weight assigned to Indicator i
- SBP = Score Based on Best Performer
- SPT = Score Based on Performance Target
- SCG = Score Based on Confidence Grading and
- $SSLB$ = Score Based on Service Level Benchmark

i. Score based on best performer (SBP)

The maximum score for the best performer on each performance indicator is 70 points. The score for attaining a national average (median) on any performance indicator is 50 points while a WSSA will be awarded a score of 0 points for attaining a minimum performance on any indicator. Intermediate performances are allocated pro rata by interpolating between the minimum, average and best performance. The formulae for calculating the scores based on best performers are as shown below:

$$\text{If } X_i \leq X_{\text{average}} \text{ then } S_i = 50x \left[\frac{X_i - X_{\text{min}}}{X_{\text{average}} - X_{\text{min}}} \right] \text{ else if}$$

$$X_i > X_{\text{average}} \text{ then } S_i = 50 + 20x \left[\frac{X_i - X_{\text{average}}}{X_{\text{max}} - X_{\text{average}}} \right]$$

Where

- X_i = performance attained by utility i in indicator X
- X_{max} = maximum performance attained by WSSAs for indicator X
- X_{min} = minimum performance attained by WSSAs for indicator X
- X_{average} = average performance attained by WSSAs for indicator X
- S_i = score based on best performer attained by utility i in indicator X

Note: For indicators whose values become better as they increase (the more the better) then the X_{min} and X_{max} should be the respective minimum and maximum value of attained performance while for indicators whose values become better as they decrease (the less the better), then X_{min} and X_{max} should be the respective maximum and minimum of actual performance.

ii. Score based on attaining the performance target (SPT)

A WSSA will be awarded 10 points for attaining or surpassing the performance target on each performance indicator. Intermediate performances will be allocated pro rata by interpolating between 0 and 10 points. In addition, decreasing performances as compared to actual performance in the previous year will be awarded 0 points. The formulae for calculating scores based on attainment of performance targets are as shown below: -

If $P_n \geq PT_n$ then $SPT = 10$ else

If $P_{n-1} < P_n < PT_n$, then $SPT = \left[\frac{P_n - P_{n-1}}{PT_n - P_{n-1}} \right] \times 10$ else

If $P_n < P_{n-1}$ then $SPT = 0$

Where

P_n = Actual performance in year n (current year)

PT_n = Performance target for the current year

P_{n-1} = Actual Performance for the previous year

The source of data for performance target will be the WSSA's approved Business Plan. In the absence of Business Plan, the WSSAs will score zero (0).

iii. Score based on Confidence Grading (SCG)

A WSSA will be awarded 10 points for surpassing the Confidence Grading of B2, 5 points for attaining a confidence grading of B2 and 0 points for a Confidence Grading below B2 on each performance indicator.

iv. Score based on attaining the Service Level Benchmark (SSLB)

A WSSA will be awarded 5 points for being within the acceptable boundaries and 0 points for not attaining the acceptable boundaries for KPIs as shown in Table 1. Scores for utilities that surpass the acceptable boundaries will be allocated pro-rata by interpolating between 5 and 10 points. This implies that 10 points will be allocated for attaining or surpassing the service level benchmarks.

6.4.1.2 Compliance to Regulatory Requirements

Compliance to regulatory requirements will be evaluated based on the evaluation criteria and scores shown in Table 5.

Table 5: Compliance to regulatory requirements

Code No.	Regulatory Requirement	Total Score	
		Regional and DT	NP
CRR1	Timely submission of monthly MajIs reports	12	12
CRR2	Timely submission of draft annual MajIs report	5	5
CRR3	Timely submission of draft annual report	5	5
CRR4	Timely submission of draft financial statements	5	5
CRR5	Remittance of regulatory levy	25	25
CRR6	Presence of approved business plan	10	10
CRR7	Presence of approved customer service charter	10	10
CRR8	Submission of final annual report for the previous year	6	10
CRR9	Availability of Water Quality Monitoring Plan	14	18
CRR10	Availability of faecal sludge treatment facilities	8	NA

The scores for compliance to regulatory requirements will be awarded as follows:

- i. CRR1: Timely submission of monthly MaJIs reports will be awarded 15 scores divided equally in 12 months (1.25 scores per month).
- ii. CRR2 to CRR4: Timely submission of draft annual reports using MaJIs reporting system, draft annual report and draft financial statements will be awarded total scores as shown in Table 5 while late and non-submission of any report will be given zero (0) scores.
- iii. CRR5: Full remittance of regulatory levy will be awarded 25 scores, less than 70% remittance will be given zero (0) scores and intermediate remittance (greater than 70% and less than 100%) will be allocated pro rata by interpolating between 0 and 25 scores based on percentage compliance. The threshold of 70% implies that utilities are expected to have *very good* to *excellent* performance in remittance of regulatory levy (*refer interpretation of scores in Table 6*). Percentage compliance to remittance of regulatory levy will be computed by considering amount remitted during the year under review divided by total invoiced and outstanding amounts.
- iv. CRR6 to CRR9: Presence of approved business plan, customer service charter, final annual report for the previous year and water quality monitoring plan will be awarded total scores as shown in Table 5 while non-availability of the document will be given zero (0) score.
- v. CRR10: Availability of faecal sludge treatment facilities will be awarded a maximum of eight (8) scores based on progress attained as follows:
 - (a) submission of evidence for acquisition of treatment facility sites will be awarded two (2) scores;
 - (b) submission of evidence for having an approved design of the treatment facility will be awarded three(3) scores;
 - (c) ongoing construction of the treatment facility will be awarded five (5) scores; and
 - (d) operational treatment facility will be awarded eight (8) scores.

6.4.2 Utility Ranking

Utility ranking is determined by summing up scores for attainment of performance targets. The total Performance Target Score (PTS) will be computed as follows:

$$Total\ PTS = 10 \times \sum_{i=1}^n w_i SPT_{X,i}$$

Where,

$SPT_{X,i}$ = Performance Target Score for utility X in Indicator i

w_i = weight assigned to indicator i , and

n = total number of key performance indicators used for ranking

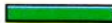




Note: Multiplication by 10 intends to standardize the results to a range 0-100.

The methodology for determination of SPT is as described in the overall ranking section.

6.5 Presentation of Performance

The total performance scores of each WSSA will be classified as A, B, C, D and E where A represents excellent performance while E represents unsatisfactory performance. The performance levels of WSSAs showing percentage scores and each classification will be identified with a distinct color. The details of the classification, color code and interpretation is as shown in Table 6.

Table 6: Classification of Performance Scores.

Total Score	Classification	Color	Interpretation
100 - 85	A		Excellent
84 - 70	B		Very Good
69 - 55	C		Good
54 - 40	D		Fair
39 - 0	E		Unsatisfactory

6.6 Draft Comparative Data and Information

The conclusion of steps 6.1 to 6.3 above is the draft comparative data analysis and information for WSSAs. EWURA will discuss the data and information with WSSAs before coming up with the final report in order to:

- (i) get a common view on the general evaluation results by presentations of the draft data and information ;
- (ii) comment and make any corrections ;
- (iii) analyze reasons for good performance and poor performances;
- (iv) deliver examples of good practices (e.g by specific case studies and examples from leading-edge utilities in a certain performance area).
- (v) review action plans for improving performance; and
- (vi) exchange practical experience among WSSAs.

6.7 Water Utilities Performance Review Report

The Water Utilities Performance Review Report will incorporate comments, corrections, reviewed performance improvement actions and best practices as concluded from section 6.6. The report will include results of performance ranking as detailed in section 6.4 and 6.5.

7. DISSEMINATION AND DISCLOSURE

Dissemination and disclosure is an essential element of the performance benchmarking of water utilities and this may include official launch of the Water Utilities Performance Review Report. The Report will be shared with various stakeholders, media and the public in the interest of transparency and for enhanced accountability.

APPENDIX 1: DEFINITIONS OF KEY PERFORMANCE INDICATORS

KPI 1: Proportion of population served with water (%)

The proportion of population served with water is the percentage of the total population living in the service areas that is served through household/premise connections and public stand posts. The number of household/premise connections shall be multiplied by the average members living in a household/premise. The number of public stand posts, kiosks, etc. shall be multiplied by the average number of the population served by one of them. Both results added will provide the number of persons served by the provider.

KPI 2: Average hours of supply

Service hours of water supply is defined as the hours per day a consumer can draw drinking water from the tap at his household connection or the public stand post. This number of hours is not necessarily identical with the operation time of treatment plants or wells, as tanks, part of the distribution system, are used for storage. The average hours service is calculated as the average hours of service in each water supply zone weighted by the total number of water connections in each supply zone.

KPI 3: Water quality compliance (%)

Water quality compliance (%) will be obtained by evaluating compliance to minimum required number of tests as specified in applicable Water and Wastewater Quality Monitoring Guidelines for WSSAs issued by EWURA and compliance to applicable water quality standards. Compliance to standards will have a weight of 60% and Compliance to minimum required tests will carry a weight of 40%.

*Hence, Water Quality Compliance (%) = (% compliance to Standard)*0.6 + (% compliance to minimum required number of tests)*0.4*

Compliance to standard = the percentage of the total number of water samples tested that passed the tests for drinking water quality standards.

Compliance to minimum required tests = the total number of water samples tested expressed as a percentage of the minimum number of tests required. The maximum compliance to required tests will be 100%.

KPI 4: Metering ratio (%)

Metering ratio is the percentage of the total water connections that have operating water meters.

KPI 5: Non Revenue Water or NRW (%)

NRW is the amount of water that the Licensee produces (or purchases from other entities) minus the amount that is sold to consumers, presented as a percentage of water produced. NRW can be the result of physical (leaks, overflow) and commercial (illegal connections, collection of revenue) losses.

KPI 6: Revenue collection efficiency (%)

Revenue collection efficiency is the percentage of bills collected during the financial year.

KPI 7: Working ratio

Working ratio is the proportion of operational expenses to operational revenue. The operational expenses do not include depreciation, interest and debt service.

KPI 8: Operating ratio

Operating ratio is the proportion of operational costs to operating revenues. Operational costs include all the expenses together with depreciation and interests costs (but no debt service payments).

KPI 9: Personnel/1000 (W&S) connections ratio

Personnel/1000 (W&S) connections ratio is the number of staff to a 1000 water and sewerage connections.

KPI 10: Wastewater quality compliance (%)

Wastewater quality compliance is the percentage of the total number of wastewater samples tested that passed the tests for wastewater effluent quality standards.

KPI 11: Proportion of population receiving WSSAs regulated sanitation services (%)

The proportion of population receiving WSSAs regulated sanitation services is the percentage of the total population living in the service area that is served with sewerage services through household/premise connections and that is served by WSSA-regulated faecal sludge emptying and safe disposal services [that is served by safe emptying, transport, treatment and safe disposal services that are duly regulated (monitored and controlled) by the WSSA]

KPI 12: Percentage of staff employed by WSSA

Total number of staff employed by the WSSA divided by the total number of staff. This will include staff under contract terms with the utility for at least one year. Staff employed under temporary terms (for less than 1 year) such as casual laborers will not be included in the computation of this indicator.

APPENDIX 2: PERFORMANCE SCORE CARD

Indicator No.	Key Performance Indicator	Performance Target	Achieved Target	Input Data	Reliability	Accuracy	Improvement Actions
KPI 1	Proportion of population served with water (%)			Connected Population			
KPI 2	Average hours of supply (hrs)			Total Population Hours of supply in each zone Number of connections in each zone			
KPI 3	Water quality compliance (%)			E-Coli samples passed E-Coli samples tested Turbidity samples passed Turbidity samples tested			
KPI 4	Metering ratio (%)			Connections with working meters Total number of connections			
KPI 5	Non-Revenue Water (NRW) (%)			Total Water Produced Total Water Sold/billed			
KPI 6	Revenue collection efficiency (%)			Revenue Collection Total amount of bills			
KPI 7	Working ratio (ratio)			O&M Cost excluding Depreciation and Interest Total Revenue			
KPI 8	Operating ratio (ratio)			Total Expenses (O&M + Depreciation + Interest payments) Total Revenue			

Indicator No.	Key Performance Indicator	Performance Target	Achieved Target	Input Data	Reliability	Accuracy	Improvement Actions
KPI 9	Personnel/1000 connections (W&S) connections (ratio)			Total number of personnel Total number of water and sewerage connections			
KPI 10	Wastewater quality compliance (%) BOD ₅ compliance			BOD ₅ samples passed BOD ₅ samples tested			
	COD compliance			COD samples passed COD samples tested			
KPI 11	Proportion of population receiving WSSAs regulated sanitation services (%)			Connected Population + Population served by WSSA-regulated Faecal Sludge emptying and safe disposal services.			
KPI 12	KPI 12: Percentage of staff employed by WSSA			Total Population Total number of staff employed by WSSA			
				Total number of staff			