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**40th WEDC International Conference, Loughborough, UK, 2017****LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND SUSTAIN WATER, SANITATION AND HYGIENE SERVICES****An analysis of potential performance improvement in Freetown's water utility using the AquaRating system***A. Swarray, A. Bangura & M. Dillon (Sierra Leone)***PAPER 2698**

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*The water utility serving the capital of Sierra Leone, Guma Valley Water Company (GVWC) faces significant challenges delivering sustainable services. To determine the potential scope within GVWC for performance improvement and to identify areas of focus for the planned investment from international partners the AquaRating (AR) system was used for the first time in Africa. The final AR score of 9.62 has underscored the challenges GVWC is presently facing in the management and delivery of quality services. However, analysis at thematic and sub-thematic levels have highlighted some positive practices in corporate governance and stressed other areas, such as customer care and water treatment processes, where efforts should be focused over the next three years. Additionally, the AR results provide an objective baseline to measure improvements over time while GVWC aims to reach the global benchmark of what a 'well performing' utility does.*

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**Introduction**

From 1990 to 2015 the proportion of urban inhabitants in Sub-Saharan Africa with access to piped water declined, from 43% to 33% (UNICEF, 2016). This was primarily caused by an increase of 212 million in the urban population over the same period and inefficiencies in the region's water utilities (WOP, 2009). Improving the performance of water utilities will be key to achieving the 2030 Sustainable Development Goals' (SDG) drinking water target of universal and equitable access for all, as well as reducing poverty and promoting economic growth. As such, well performing water utilities are imperative considering the population is expected to grow by a further 794 million from 2015 to 2050 (UNITED NATIONS, 2014).

Freetown faces similar challenges as mentioned above, in 2016 it had an estimated population of 1,050,301 and this is expected to reach to 2.5 million by 2050 (GoSL, 2016). Presently, 29% of the city's population have access to a piped connection and approximately 31% access water through a public standpipe. The remaining 40% are not supplied by the water utility's network, instead they get water predominately from groundwater sources (MWR, 2014).

**GVWC background information**

GVWC was established under the 1961 Guma Valley Water Ordinance to serve Freetown. The utility is a parastatal; 99% owned by the government of Sierra Leone and 1% by the Freetown City Council, and is expected to be financial sustainable through water tariffs.

The utility is faced with several challenges such as an aged infrastructure, much of which predates the 1970's, with estimated non-revenue water (NRW) losses as high as 50% (DfID, 2016). GVWC's tariffs have not increased since 2006, however in November 2016 the tariff was adjusted upwards to US\$6.74 per month for household connections due to decreased value of the Sierra Leone currency. The adjusted tariff translates to as low as US\$0.42/m<sup>3</sup>. This is less than what some utilities consider to be a well performing charge e.g. Uganda's National Water and Sewerage Corporation's residential tariff of US\$0.77/m<sup>3</sup> or Senegalaise des Eaux increasing block tariff of US\$.40, US\$1.39 and US\$1.75 for less than 20m<sup>3</sup>, 21m<sup>3</sup> to 40m<sup>3</sup> and above 40m<sup>3</sup>, respectively (WSP, 2016). To further compound the issue of low revenues, GVWC has a low

collection efficiency, from an estimated 54% in June 2012 to 75% in March 2015 (GVWC, 2013) (WSP, 2015).

In addition to difficulties faced in maintaining the aged infrastructure and managing operations, GVWC has significant challenges supplying sufficient water to Freetown. GVWC's main source is the Guma Dam, which has a maximum capacity of 87ML/d and supplies most of the water within the GVWC system (DfID, 2016). However, after the rains cease in September of every year, supply is rationed, decreasing to approximately 60ML/d per day by the end of the dry season (UNDP, 2016). Solutions to provide adequate supply to Freetown are longer term. These will be very costly and technically complex as alternative sources within the Western Area are now threatened due to uncontrolled urban development in Freetown and its environment (DfID, 2016).

Over the past decade, focus has been on institutional and operational improvements within GVWC as capital investment has not been readily available. During 2012 and 2013, GVWC went through a series of transformation programs focusing on improving revenue collection, reducing NRW and customer care. By the end of 2013, collection efficiency had improved from 54% in June 2012 to 90% in December 2013 and NRW had reduced from 54% in January 2013 to 46.9% in December 2013 (GVWC, 2013). These improvements were not sustained due to the severe economic and socioeconomic impacts from the 2014/15 Ebola outbreak as shown in the lower collection efficiency from March 2015 as stated above.

As a step towards addressing the numerous challenges facing GVWC, the United States Government through the Millennium Challenge Corporation (MCC) signed a US\$ 44.4 million Threshold Program (THP) grant with the Government of Sierra Leone. Specifically, for GVWC, the THP aims to improve commercial practices, operational independence, and planning capacity at GVWC; while enhancing transparency, accountability and customer service practices through improved customer engagement. Additionally, improving water supply to Freetown was made a major target in the Presidential Recovery Plan following the end of the Ebola outbreak and consequently GVWC acquired funding from the Department for International Development (DfID) for a large capital investment program. Therefore, beginning in 2017, GVWC will begin a large capital investment and institutional reform programme, both of which are expected to conclude in 2020.

## **Water utility performance rating systems**

Significant efforts have been made over the past three decades in assessing the performance of the water and sanitation sector in general and service providers such as water utilities, in particular. These efforts cut across global, regional and local levels and despite their differences in approach or methodology, they all share a similar attribute of trying to measure, monitor and improve performance in the sector. Notable institutions involved in water utility benchmarking or performance rating are International Water Association (IWA), the International Benchmarking Network for Water and Sanitation Utilities (IBNET) of the World Bank and the Water Operators Partnerships (WOP). The combined efforts of these institutions, utilities and Governments has resulted in frameworks to compare performances, inform policies, regulations and funding decisions in the water and sanitation sector.

Nonetheless, this paper focuses on the AquaRating (AR) system hosted at IWA. AR is an assessment system for water and wastewater utilities, it is not intended as a benchmarking tool or a means of comparison across utilities. Instead the purpose of AR is to provide an international system to improve services of water and sanitation utilities by acknowledging good performance and practice through an audited evaluation and improvement plan. The information produced by AR is confidential and cannot be shared without consent from the utility. AR was first implemented in 13 utilities in across Latin American, Caribbean and Europe, more recently assessments have been conducted for utilities in Latin American, China and Fiji, Utilities which have used AR include Aguas de Alicante, Water Authority of Fiji, Aguas Andinas Santiago de Chile and Companhia de Saneamento Básico do Estado de São Paulo, etc.

AR assesses the performance of utilities on a score of 0 to 100, calculated as the percentage of the 112 elements found accomplished using their corresponding reliability and weighting values. The elements are categorized in 8 thematic groupings:

1. Service quality (SQ): The quality with which drinking water and wastewater services are delivered, including user perceptions of services received
2. Investment planning and implementation efficiency (PE): The appropriateness of the utility's investment plans and their implementation efficiency.
3. Operating efficiency (OE): Measures efficient use of water and energy resources available to the utility, including efficient management of infrastructure and of operation and maintenance costs

4. Business management efficiency (ME): Considers the content and implementation of the utilities strategic plan, the quality of the utility's management controls and human resource management processes and efficacy, compliance and transparency of its procurement management system.
5. Financial sustainability (FS): This rating area assesses the utility's capacity to finance business continuance based on the flows generated by service provision.
6. Access to service (AS): This area assesses practices followed to facilitate service access to the entire population within its geographical area, as well as assessing a series of quantitative indicators that enable rating of the degree of physical service coverage and the financial accessibility of the service.
7. Corporate governance (CG): The autonomy, accountability and transparency in the relationship between the utility's directors and its owners, and between the directors and other stakeholders
8. Environmental sustainability (ES): Assesses the implementation of environmental considerations in system management and the environment impacts that it produces.

As work to develop the THP progressed, the question of how to measure, monitor and define success or progress somewhere down the line became evident. A reference point which was not readily available was needed. Having this in mind it was concluded to deploy AR because of attributes described above, its independence, wide coverage of utility performance indicators, but also the rigour in checking the veracity and reliability of the information provided by the utility provided through the auditing process.

Despite the challenges encountered in the application of the AR system to GVWC, its findings, which are discussed in subsequent sections will serve as a starting point to develop a strategic performance improvement plan for GVWC covering the period 2017 to 2020.

### **GVWC AquaRating process**

For GVWC, the AR base year was 2014 and the following lists the assessment process:

- Introductory Workshop: April '16: A workshop was held to introduce AR and provided practical guidance to staff of GVWC for the self-assessment. An action plan was developed which set out roles and responsibilities of GVWC, the applicability of AR to GVWC and identified challenges and solutions which may be encountered in its implementation.
- Self-Assessment: April '16: GVWC staff completed a self-assessment assisted by AR's International Consultant. A feedback report was developed which included some implications of the assessment on current GVWC operations and an outline of the processes to be undertaken to complete the assessment.
- Document uploading: Aug – Oct '16: GVWC uploaded 60 and 195 mandatory and optional required reliability documentations to the AR platform with support from a local Consultant.
- Desk and Onsite Audit verification: Nov '16 – Jan'17: An external audit company, accredited by the AquaRating Entity was hired to verify whether there was sufficient evidence of compliance for all elements including reliability reported. This included a desk review of the documents uploaded and a visit to Freetown to physically confirm evidence of elements which cannot be verified with only documentation, or which due to confidentiality, size etc. could not be uploaded onto the AR platform or for elements which normally do not have supporting documentation.
- Certification and Performance Improvement Action Plan: April '17: A final AR report published, including certification of GVWC, along with improvement plan and monitoring strategies and timelines for next assessment.

### **AquaRating findings**

Based on the initial self-assessment (SA) an initial rating of 16.07 was provided to GVWC. However, following the external audit as described in the previous section, the rating was reduced from 16.07 to 9.62. This was primarily due to lack of evidence of compliance based on the information provided by the documents uploaded by GVWC or from the results of on-site audit.

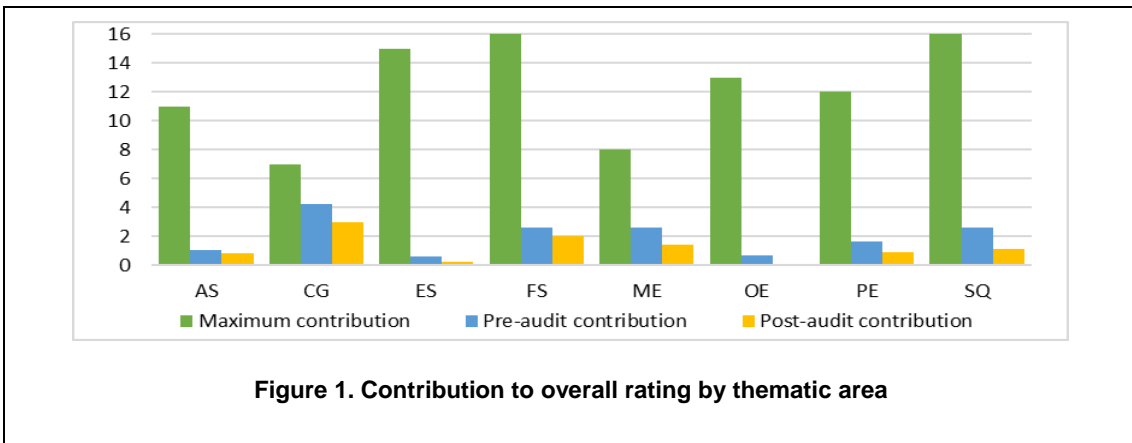


Figure 1. Contribution to overall rating by thematic area

Figure 1 provides the maximum, pre-audit and post-audit contributions to the overall rating by thematic area, Comparing the pre-audit and post-audit results there is a notable reduction across all thematic areas. The largest reductions were in CG, SQ and ME, which reduced by 31%, 56% and 45% respectively, however GWVC was still found to be performing better in CG and ME relative to the others. Similar to the pre-audit assessment findings, ES and OE were the lowest performing thematic areas and contributed the least to the overall rating, while the performance and contribution to the final rating of AS, FS, PE and SQ were found to be similar.

Using the pre-audit findings, each thematic area can be further disaggregated into sub-thematic areas. The following figures present the ratings by sub-thematic area for the four thematic areas with the highest rating.

Corporate Governance was rated 60.97, the highest across the 8 thematic areas. The relatively high score for CG was due to the utility having formal and business autonomy, legal documentation that defines its functions and responsibilities, a functioning board of directors and clear auditing and control practices. CG3 performed weakly due to poor disclosure of financial and service delivery information.

CG1: Utility autonomy and responsibilities	71.43
CG2: Decision making processes and accountability	74.92
CG3: Transparency and control	44.11

Figure 3. CG's rating by sub-thematic area

ME1: Strategic planning	43.86
ME2: Management control	20.00
ME3: Organizational structure	65.00
ME4: HR management	39.70
ME5: Procurement management	52.90
ME6: Staff and support resource management	0.00

Figure 4. ME's rating by sub-thematic area

Business Management Efficiency received an overall rating of 32.87, resulting from the availability and quality of its strategic plan, a clear organisational structure, the presence of good practices in human resource management and the value and quantity of purchases made through public tender. However, staff training and managing overtime for ME6 and establishing a set of processes to monitor the organisation's performance, ME2 scored low.

Financial Sustainability was rated 15.45, FS2 and FS3 performed well relative to FS1, however in general GWVC was found to be weak in this area with insufficient capacity to finance business with revenue generated by service provision.

Service Quality was rated 15.17, water quality for the treatment plant was found to be satisfactory, however there are issues with supply continuity, processes for water quality testing and documentation and customer and complaint management.

FS1: Overall financial sustainability	1.17
FS2: Financial management	33.52
FS3: Customer management	28.11

**Figure 5. FS's rating by sub-thematic area**

SQ1: Drinking water quality	16.47
SQ2: Distribution of drinking water for use and consumption	21.55
SQ3: Wastewater collection	0.00
SQ4: User service	4.60

**Figure 6. SQ's rating by sub-thematic area**

Considering, the remaining thematic areas, PE has an overall rating of 13.58, which resulted from a relative high rating of 25.44 in Investment Plan Content and Efficiency (PE1) and 20.75 in Existing Physical Assessment Management Efficiency (PE3). All other sub-thematic areas had a score of 0. AS had an overall rating of 9.74, this score is mainly based on the affordability of the current tariff structure, with access to the service considered poor with scores of zero in AS1.1 and AS1.2. OE performed relatively weakly with a score of 5.27, chiefly due to inefficiencies in water and energy use and non-established accounting practices to measure and optimise operating and maintenance costs. All sub-thematic areas were rating 1 or less, except for Infrastructure Management Efficiency (OE3) which was rated 13.88. And, ES had the lowest rating of 3.85.

**Discussions**

It is clear from the final overall rating of 9.62 that GVWC is presently facing a lot of challenges in the management and delivery of quality services. Based on the findings of AR, some examples areas where GVWC should target to achieve short term performance improvements with their available resources are:

- improving the performance of CG by focusing on transparency and control (CG3) through publicly disclosing information about service delivery and institutional arrangements and processes.
- concentrating on improving its management control systems (ME2) (performance indicators/targets, monitoring systems, documentation of practices and processes and reporting, etc.) in the delivery of services. This is something that should be relatively less costly but could result to a large impact.
- introducing tariffs that are equitable, covers long term costs, and are differentiated by service types to improve FS1 which had a rating of 1.17.
- establishing a formal and systematic documentation procedure for water quality and treatment processes and minor rehabilitation to treatment plant could improve the score of SQ1.
- strengthening the operations and maintenance system for supply and distribution network would provide a shorter-term increase for SQ2. In the longer term, GVWC need to solicit public and private funds for large scale investment.
- developing and operationalizing strong and comprehensive customer care practices, e.g. the establishment of a call centre for customer care, publication of customer charters, expanding the methods for payment, etc. This would improve the score of SQ4 which was low relative to SQ1 and SQ2.
- improving leak detection and maintenance and improving water use efficiency in production and treatment processes including establishment of documentation procedures could improve OE1.

**Lessons learnt**

- Having listed some of the areas of improvements for GVWC above, it is worth highlighting the lessons learnt in applying it to GVWC, a utility faced with multiple challenges and operating in a low capacity environment. These lessons learnt may be relevant to utilities in similar situations:
- Comprehensively evaluating a utility's performance and comparing against international best practice can reveal relative areas of strength that are not easily identifiable in their day to day operations. Utilities could build upon and learn from these areas of strength when developing and implementing performance improvement plans.
- The AR system is universal and is designed to rate utilities without considering the context that the utilities operates within, this may result in thematic areas and weighting that may not be fully appropriate

for utilities like GVWC, e.g. AS is weighted less than ES, however in a context with chronic water storages and regular public health outbreaks it could be argued that AS should be weighted higher.

- Findings must be carefully interpreted and applied to ensure that low performing utilities continue to improve on performance indicators that relates to their core functions, e.g. cash collections, staff productivity, household connection and cost reflective tariff, and not just resort to improving practices and processes with the sole intent of improving their AR rating.
- Utilities such as GVWC will more likely have poor quality documentation/data. As such, the reliability of such a utility's documentation/data could reduce post-audit scores considerably as was exhibited in the case of GVWC e.g. Post-audit, OE, ES & SQ reduced by 88%, 60% and 56% respectively.
- In addition to poor quality documentation/data, utilities such as GVWC may need support to source the required documentation to prove accomplishment due to poor documentation and information management practices, this increases the cost of the AR and lengthen the time needed for the assessment.
- There may be a tendency by external stakeholders to misinterpretation the rating as a reflection of the poor performance of the utility's management, when in actual fact, the resources to address some of the more critical challenges, such as tariff restructuring, capital investment, etc. are not available.

## Conclusion

In general,, AR found GVWC to have relative low performance in all areas. However, it also shows a great potential for performance improvement and due to its comprehensive nature, it identified short term and realistic reforms for GVWC to achieve quick performance improvements without external support.

The realisation of the performance improvement identified through AR by GVWC will require sound management decisions with pragmatic and incremental improvements. This will require support from internal and external stakeholders and partners. The rating has been an illustrative and learning process for GVWC to understand their present status and weaknesses. Already, GVWC has used this information to help define and establish new internal departments mandated to monitor operations and improve access to public water services This restructuring indicates the willingness and capacity of GVWC to respond to comprehensive assessments that provide sufficient detail to inform reform processes.

Externally, the independent Electricity and Water Regulatory Commission (EWRC) has commenced to regulate tariffs and set performance standards and guidelines for GVWC. In addition, over the next three years GVWC will receive significant investment for infrastructure rehabilitation, institutional strengthening and investment planning from DFID, MCC and African Development Bank (AfDB). These supports will contribute to improving service delivery and financial sustainability.

Finally, the ratings will contribute to developing performance monitoring indicators to measure progress through the implementation of a Strategic Performance Improvement Plan (SPIP), this will capture all thematic areas covered by the AR system and will provide a guide for GVWC to improve its performance.

## Acknowledgements

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## Notes

The estimated 2050 population of Freetown was calculated using the provisional 2015 census results as base and applying the average growth rate found from 2004 to 2015 of 2.83%.

The estimated volumetric tariff of US\$0.42/m<sup>3</sup> was calculated using the average consumption found in the 2014's Willingness and Ability to Pay Study for piped connections of 76 litres per person per day and an average seven habitants in the household (MWR, 2014).

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