

15 years of Water Safety Plans Development and Implementation in Uganda

The World Health Organization recommends Water Safety Plans as the most effective means to ensure the safety of drinking-water supplies, but their application in developing countries remains low. This study is about the status of the Water Safety Plans and the factors that led to their uptake. Ch. Kanyesigye², J. Nakanjako², F. Kansime³, G. Ferrero⁴, S.J. Marks¹

Introduction

Target 6.1 of the Sustainable Development Goals (SDGs) aims at achieving universal and equitable access to safe and affordable drinking water for all by 2030. Achievement of this target is measured using indicator 6.1.1, which emphasizes the proportion of the population using safely managed drinking water services [1]. The challenge of sustainably providing safe drinking water can be addressed through the implementation of risk assessment and risk management approaches, such as Water Safety Plans (WSPs). The objectives of WSPs are to identify risks from catchment to consumers, prevent contamination of raw water sources, appropriately treat water to remove contaminants and prevent re-contamination during distribution, storage and handling [2]. By 2017, Uganda was among the eleven African countries that carried out WSP implementation. Piloting of WSPs was carried out by the National Water and Sewerage Corporation (NWSC) between 2002–2004 in two major cities, Kampala and Jinja. By 2009, WSPs were developed and implemented in 20 Water Supply Systems (WSS) under the jurisdiction of NWSC. This study assesses the status of WSP development

and implementation in Uganda for the period 2002–2017, focusing on the NWSC experience and the factors that influenced WSP uptake.

Methods

The study focused on the 20 WSPs located across Uganda that are under the jurisdiction of NWSC (Figure 2). A mixed methods approach was used, consisting of documentary review, field observations, semi-structured interviews with NWSC staff and stakeholders, and an internal informal audit. The audit was carried out through a desk review of all WSP documents for each of the 20 WSS. The audit objectives and questions were based on the WHO’s grading system for assessing WSS performance [3], ranging from a grade of “excellent” for top scores and “priority attention needed” for the poorest performing WSS.

Result and Discussion

1. Status of WSP development and implementation

The level of WSP development and implementation varied greatly across the 20 WSS. No WSS scored excellent (115–≥120), very good (103–114) or good (91–102). Three

WSS attained average scores (79–90), four scored below average (61–78), and the rest were at “needed priority attention” (≤60) (Figure 1). Each WSS had carried out hazard identification, risk assessment, determination of control measures and development of improvement plans. Most of the WSS failed to document plans for monitoring, verification, corrective actions and review of the WSPs. These findings reflect those found in a WSP global status report, that attention was focused on the front end of the WSP development to the detriment of the operational monitoring, management and review, which are key for sustainability [4]. In addition, all 20 WSS implemented improvement plans, although for most, these activities were not up-to-date. Over the study period, internal and external verification audits were documented by five and two WSS, respectively. Similar findings of inadequate WSP implementation were obtained in audits of utilities in Uganda, Kenya and Tanzania [4].

2. Factors influencing the WSP status

The factors having a positive and negative influence on WSP implementation were examined, and those having a negative influence were:

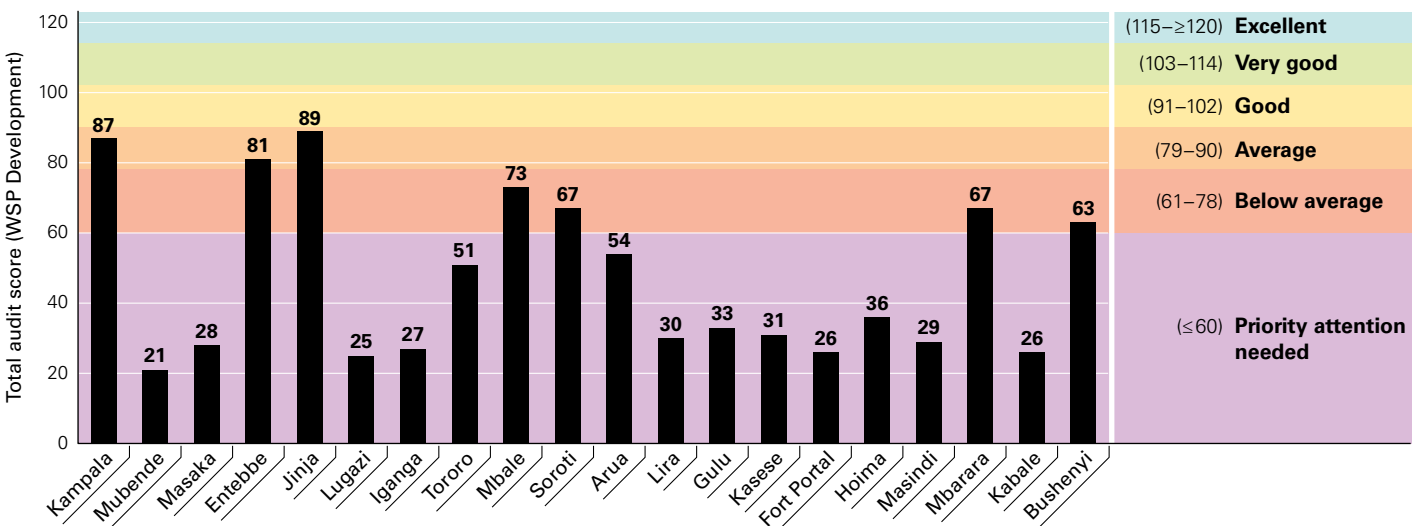


Figure 1: Summary of the informal internal audit results.

WSP team composition: 50 % of management and operational staff interviewed believed that WSP implementation was the responsibility of technical departments. This is opposed to the basic principles of WSP team formation [2]. Audit results showed that about 50 % of the 20 WSS had complete, qualified and experienced multidisciplinary WSP team membership. However, inadequate mechanisms for handover and training of transferred staff resulted in gaps within WSP teams.

Perception of WSP effectiveness: About 25 % of management and staff interviewed reported that some managers did not appreciate WSPs as a worthwhile risk management approach, claiming that the quality of water supplied usually complied with national standards. This indicates a lack of knowledge regarding the value of preventive risk management for effectively sustaining drinking water quality [2]. The audit, however, revealed that water quality results for 13 of the 20 WSS did not consistently comply with the standards.

Managerial commitment: Less than 33 % of top management and staff interviewed responded that area management was committed to invest in WSPs. The audit revealed that about 50 % of the WSS had documented and implemented plans for the monitoring of control measures. They had also prepared procedures for management of the systems, and had developed and documented support programs for WSP sustainability. However, a few top managers expressed concern that some teams did not continue implementing after receiving training.

Incapacity for WSP evaluation: Less than 33 % of management and staff interviewed expressed difficulty in evaluating the performance of WSPs. They could not quantify the benefits of WSP implementation that would help in soliciting management buy-in. The reason for this failure, as shown by the audit, was that the WSP verification steps had not been completed in nine out of the twenty WSS.

Inadequate training: Almost all management and staff interviewed stated that there was a lack of regular WSP training. Similarly, six out of the twenty WSP teams expressed concern about a lack of knowledge among staff for WSP implementation. From the audit, nine out of the twenty WSS mentioned training as one of the WSP support programs, but stated that it had been poorly implemented.

Heavy workload: The audit results showed that six out of the twenty WSS had carried out complete documentation of the WSPs, i.e., supply chain and manual steps. Failure

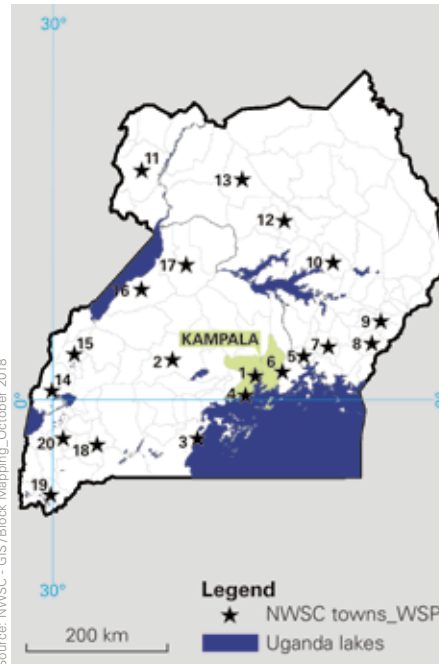


Figure 2: Location of the 20 NWSC WSS implementing WSPs.

of the rest of the WSS to carry out complete documentation could have been due to workload and competing management priorities, as mentioned by four out of twenty WSP team members.

The factors that had positive influence were:

Public health responsibility: About 50 % of top management and staff interviewed reported that NWSC has a duty to provide potable water to the public, and believe that this cannot be achieved without WSP implementation. The respondents said that management was supportive by providing human resources and finances in response to water quality challenges in the service areas.

Good customer relations: The audit findings showed that in seven of the twenty WSS, customer engagements were planned and implemented as part of WSP supporting programs. Over 50 % of management and staff reported good customer relations, in line with NWSC's motto: "the customer is the reason we exist". The respondents reported that customers provided feedback on performance through the front desk and the call centre.

Enhanced reporting culture: Less than 33 % of management and staff interviewed said that through social media platforms, e.g. WhatsApp, employees were updated on operational incidents and events. The audit findings revealed that internal communication platforms were part of WSP support programs and were applied in nine out of the twenty WSS.

Enhanced corporate image: Over 25 % of management and staff interviewed stated that NWSC had a good public image due to the quality of service and recognised WSPs as a means of maintaining that image. Among the WSP support programs was customer engagement and feedback on complaints, particularly through the call centre.

Reliable laboratories: The audit revealed that well equipped laboratories enabled planned monitoring of control measures in nine out of the twenty WSS. Detailed water quality analysis for the smaller WSS took place at regional laboratories to back up their limited basic process control and monitoring.

Conclusion

The status of WSP development and implementation varied greatly among the 20 WSS. From the audit, a few WSS scored average, while most scored below average. All the WSS carried out hazard analysis and risk assessment, but only a few documented and implemented the monitoring and management steps. The factors that negatively affected WSP status were inadequate teams, WSP appreciation, commitment, training, WSP evaluation and heavy workload. Those with positive effect were customer relations, public health responsibility, reporting culture, corporate image and reliable laboratories.

- [1] WHO & UNICEF (2015): Progress on sanitation and drinking water 2015 update and MDG assessment, Geneva.
- [2] Bartram, J., Corrales, L., Davison, A., Deere, D., Drury, D., Gordon, B., Howard, G., Reinhold, A. and Stevens, M. (2009): Water Safety Plan Manual: Step-by-step risk management for drinking-water suppliers. World Health Organization, Geneva.
- [3] WHO & IWA (2015): A practical guide to auditing water safety plans, Geneva.
- [4] WHO & IWA (2017): Global status report on water safety plans: A review of proactive risk assessment and risk management practices to ensure the safety of drinking-water, Geneva.

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