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**SUSTAINABLE WATER AND SANITATION SERVICES
FOR ALL IN A FAST CHANGING WORLD**

**Monitoring water and sanitation service levels over time:
findings from WaterAid Malawi**

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Post-implementation monitoring surveys (PIMS) are part of WaterAid's global monitoring requirements for assessing the current status of water and sanitation services installed 1, 3, 5 and 10 years previously. This Briefing Paper sets out a summary of findings and recommendations from a survey undertaken in Salima District during August 2013. Findings are discussed in relation to four service level indicators for water (quantity, quality, access and reliability) and for sanitation (design, use, quality and hand-washing). Two critical findings for water concern per capita consumption and significant variations in the performance of different pump types. For sanitation, two challenges relate to the distance between latrines and communal water points, and secondly sustaining hand-washing facilities.

Introduction

WaterAid is an international non-governmental organisation that has worked in Malawi since 1999 to transform lives by improving access to safe water, improved hygiene and sanitation some of the most vulnerable and excluded districts.

Sustainability is one of WaterAid's key programme principles. A framework setting out WaterAid's understanding of sustainability has been developed, which defines it as "*whether or not WASH services and good hygiene practices continue to work and deliver benefits over time. No time limit is set on those continued services, behaviour changes and outcomes. In other words, sustainability is about lasting benefits achieved through the continued enjoyment of water supply and sanitation services and hygiene practices.*" (WaterAid, 2011)

A commitment set out in WaterAid's framework is that all country programmes will monitor the functionality and use of water and sanitation services one, three, five and ten years after implementation. The purpose of these long-term monitoring surveys is to better understand service quality over time and identify lessons to inform the development of more effective future programmes.

Methodology

In August 2013, WaterAid staff worked with colleagues from Work for Rural Health (our NGO partner in Salima) and Health Surveillance Assistants to conduct data collection for the PIMS process. WaterAid has supported work in Salima district since 1999, focusing principally on the four traditional authority areas of Mwanza, Msosa, Kulunda and Maganga.

WaterAid's global guidance for PIMS sets out a sampling frame for non-statistically representative surveys. In line with that approach, we stratified the inventory maintained Work for Rural Health to identify water points installed 1, 3, 5 and 10 years ago as well as by the two different hand-pump types installed (Afridev and MALDA). Once stratified, villages were selected at random from the list with a total of 12 villages selected for each year cohort. A separate inventory for sanitation was not maintained, hence information on sanitation did not form part of the sampling framework and limited information on sanitation was available prior to data collection.

In each village, a focus group discussion was facilitated with users of the water point and members of the management committee. Members of six households were also interviewed about water, sanitation and

hygiene. The selection of households was made by enumerators with the intention of selecting relatively wealthier / poorer families at varying distances from the water point.

An adaptation from WaterAid's traditional approach to PIMS was to introduce an analysis of service levels. Service level indicators and ladders set out in IRC's WASHCost initiative (Fonseca, C. et al, 2011; Moriarty, P. et al, 2011; Potter, A. et al, 2011) were reviewed to ensure compatibility to the Malawi context and for WaterAid's priorities. We attempted to separate reliability into source and resource related components by making water point functionality part of the access indicator. The service ladder for water quantity was refined to align with national standards. For sanitation, we developed indicators and ladders for latrine quality and presence of hand-washing facilities at the expense of the reliability and environmental protection components used by WASHCost. Table 1 and 2 set out service levels for water and sanitation respectively.

	Quantity	Quality	Access	Reliability
High	>50 litres per person per day (WHO, 2011)	Favourable user perception and meets national standards based on regular testing	Less than 10 metres	Works throughout the year
Improved	Between 27 and 50 litres per person per day (Semanou, A. Sarpong K, 1999)	Favourable user perception and meets national standards based on occasional testing	Less than 500 metres and normative population per functioning water point	Reliably unreliable (i.e. people are aware when water will be available)
Good	Between 15 and 26 litres per person per day (Sphere, 1997)			
Basic	Between 5 and 15 litres per person per day	Moderate user perception and / or results from testing are not known, or no testing occurs	Between 500 and 1000 metres and / or more than normative population and / or partially functioning water point	Unreliably unreliable (i.e. people do not know when water will be available)
No service	<5 litres per person per day	Poor perception and / or failure to meet national standards	More than 1000 metres and / or non-functioning water point	Water is not available for consecutive weeks

Source: Adapted from Fonseca, C. et al (2011)

Summary of findings

Water: quantity

The method of calculating per capita consumption was through observing the size of container(s) used for collecting water, the number of trips per day and the number of people in the household. It was therefore an imperfect estimate rather than a measurement of actual practise.

Findings did not reveal a clear correlation between per capita consumption with the length of time water points had been installed. The proportions of households receiving different levels of service were broadly similar across all year cohorts, with the majority receiving a 'good' level of service. A 'good' level of service meets the basic requirement set out in sphere guidelines, but does not meet national standards.

A relationship did appear to exist between the numbers of people living in a household with the quantity of water available per person. In households where occupancy rates were between 1-3 persons, the majority received an 'improved' to 'high' service level, but as occupancy rates increased, generally a greater proportion were found to benefit from 'good' or 'basic' quantities.

	Design	Use	Quality	Hand-washing
High	Inclusive latrine design ensuring equitable access for all users	Latrine used by all household members (including children) all of the time	Private, no faecal matter, no smell and no flies	Container with water and soap available close to latrine
Improved	Latrine with impermeable slab separating user and faeces	Latrine is used by some members of one household some of the time	Private and no evidence of faecal matter – but either smell or flies	Container with water and ash available close to latrine
Basic	Latrine with permeable slab separating user and faeces	Latrine is used by members of more than one household	Private. But presence of faecal matter, smell and flies	Container with water available, but no soap or ash present
No service	No separation between user and faeces	Not used	No privacy, presence of faecal matter, smell and flies	No facility – or container with no water available

Source: Adapted from Fonseca, C. et al (2011)

Water: quality

This indicator considered user perception of water quality as well as results from testing. We found that user perception was high, with 89% indicating a favourable preference, however feedback of results was not systematic. Water quality testing had been conducted at 77% of villages, but only 50% of those had received feedback. In all cases, feedback confirmed that water quality was within national standard parameters. We were not able to ascertain results for the other 50% that were tested. Available results from testing showed that 60% of boreholes supplied water that conformed to national standards, whereas 43% of hand-dug wells were within the permitted range.

Water: access

Hand-pump functionality was a key component for this indicator. Functionality was assessed by conducting a stroke and leakage test on each pump to measure a) the time taken to fill a 20 litre bucket and b) the number of strokes needed to get water flowing after a 5 minute rest period.

Comparing results between pump types revealed a clear distinction in performance for MALDAs and Afridevs. Across all age cohorts, just 35% of MALDAs (9 pumps) were fully functional with a further 30% (8 pumps) assessed to be partially functional. A very different picture was found for Afridev pumps, where 86% (18 pumps) were fully functional and the remaining 14% (3 pumps) were partially functional.

We found that 66% of MALDAs installed one year ago did not pass the pump tests and were therefore recorded as being non-functional. The proportion of non-functional hand-pumps was found to reduce in villages where they had been installed 3, 5 and 10 years ago. We also found both the number of hand-pumps breaking down and the number of breakdowns per pump increased the longer pumps had been installed.

Water: reliability

Prior to PIMS, we had been informed that hand-dug shallow wells were not providing reliable access to water. Indeed, the District Water Officer in Salima had stated that he was not supportive of installing hand-dug wells due to issues of seasonality. However, results indicated that sampled water points faced fewer reliability issues than anticipated. For boreholes fitted with Afridevs, we found 95% provided year round access; for shallow wells fitted with MALDAs, we found 77% provided year round access.

Given the position of the District Water Officer, reports from other organisations (Watering Malawi, 2012) and anecdotal evidence from Work for Rural Health, we conclude the clarity of questions on reliability should be improved.

Sanitation: design

The project inventory maintained by Work for Rural Health contained detailed water point data, but lacked information on sanitation. Although Work for Rural Health integrates water and sanitation, it may be the

case that sanitation initiatives were supported in selected villages over a period of time rather than only the year in which the water point was installed. Such uncertainty in the timing of sanitation interventions influenced a decision to assess sanitation service levels by Traditional Authority rather than year cohort.

WaterAid's approach to sanitation was to promote improved access through subsidising the construction of cement sanplats. However, the sanitation landscape has shifted in recent years with CLTS and sanitation marketing being recognised in national policy as a more appropriate approach.

The national definition for 'improved latrines' includes the requirement that a latrine must be at least 30 metres from a water point and have an impermeable floor. Basic latrines must be 30 metres from a water point, but can have a permeable floor. If latrines are within 30 metres, the facility is classified as providing 'no service' due to the threat of contamination, regardless of other design considerations.

Findings suggest that in each Traditional Authority area, the majority of households did benefit from the subsidised approach and do have a latrine with an impermeable floor; 71% of households had a latrine with an impermeable floor, 25% had a traditional latrine and 4% had no latrine. This indicates that high rates of latrine coverage can be obtained through a subsidised approach, but it's also recognised that many years of investment and support were required.

It was troubling to find that 43% of latrines were located within 30 metres of the water point. This does not match with WaterAid's experience, with programme quality requirements or anecdotal evidence from other project visits; it demands further investigation.

Sanitation: use

For the full benefits of latrine use to be realised, all households in a community should have a latrine and all household members should use it all of the time. Findings revealed that 81% of sampled households used their own latrine all of the time. However, it may be the case that this indicator assessed knowledge of hygiene promotion messages rather than capturing the actual practise of household members.

Sanitation: quality

WaterAid believes that for people to want to use a latrine, it must be clean and be free of flies and smell. Privacy must be assured to preserve the dignity of latrine users. Latrines that were not private were classed as providing 'no service' as they failed to protect dignity.

Positive results were observed across all districts, with minimal proportional variations in service levels. In total, 48% of latrines provided the highest level of service and an additional 38% provided an improved level, which was highly encouraging and suggests latrines were being cleaned and maintained.

Latrine cleanliness was not restricted only to improved pit latrines (91%) and twin-pit eco-san latrines (86%) installed with WaterAid support, but 82% of traditional latrines were also found to offer privacy and a floor free of faecal matter. Proponents of CLTS advocate that traditional latrines can provide users with a clean environment; cheap does not have to mean dirty (Cole, B. 2013). Evidence from this survey suggests that the sampled traditional latrines provided an environment comparable with improved latrines.

Sanitation: hand-washing

Evidence from selected households reflected the challenge of encouraging people to sustain hand-washing behaviour. The majority of latrines in all Traditional Authority areas had no hand-washing facility available; the sample average was 44%. Whilst this does not mean hand washing did not take place, the proxy indicator of hand-washing facilities near latrines is one of the more reliable indicators of practise (Ram, P, 2010).

Across the Traditional Authorities, there was little variation regarding the proportion of latrines with different service levels for the hand-washing indicator. It is somewhat encouraging that the sample average for households reporting 'high' or 'improved' access to hand-washing facilities was 31%. However, an unequal distribution of results from enumerators was found and it may be possible that some bias was introduced during data collection.

An overview of recommendations

Findings are based on a relatively small sample of 48 villages from one district of Malawi, thus conclusions and recommendations should be viewed in that context. Completing similar PIMS exercises in other districts may challenge or substantiate the findings and recommendations presented.

SHAW

Reflecting on our experience with using service levels to analyse PIMS data, we have made recommendations to amend some indicators to enhance the clarity of findings; revised service levels are set out in Table 3 and 4. The following recommended changes have been made for water service levels:

- Assessments of water quality should be complemented with sanitary risk surveys to identify potential hazards.
- Indicators of access regarding distances between households and water points should be revised to align with standards for sanitation quality and national policy.
- Reliability should incorporate assessments of both the source and resource.

	Quantity	Quality	Access	Reliability
High	>50 litres per person per day	Meets national water quality standards. Favourable user perception. Low sanitary risk score.	Less than 30 metres with a normative population per water point	A fully functional water point and water is available all day, every day
Improved	Between 27 and 50 litres per person per day	Meets national water quality standards. Favourable user perception. Intermediate sanitary risk score.	Between 30 and 500 metres and a normative population per water point	A fully functional water point and water is available every day, but not all day
Basic	Between 15 and 26 litres per person per day			
Sub-standard	Between 5 and 15 litres per person per day	Meets national water quality standards. Moderate user perception. High sanitary risk score.	Between 30 and 500 metres and more than a normative population per water point	A partially functional water point and / or water is available almost every day, but occasionally there is no water
No service	<5 litres per person per day	Failure to meet national water quality standards. Poor user perception. Very high sanitary risk score.	More than 500 metres and more than normative population per water point	A non-functional water point and / or no water was available for two or more weeks during the past year

The following recommended changes have been made for sanitation service levels:

- Review the sequencing of indicators to complement those for water supply
- Change ‘design’ to ‘access’ and restructure service levels to provide a basic level of service for permeable latrine slabs, as per the ODF strategy.

	Use	Quality	Access	Hand washing
High	Latrine used by all household members (including children) all of the time	Private, no faecal matter, no smell and no flies.	Inclusive latrine design ensuring equitable access for all users	Container with water and soap available close to latrine
Improved	Latrine is used by some members of one household some of the time	Private and no evidence of faecal matter – but either smell or flies	Latrine with impermeable slab	Container with water and ash available close to latrine
Basic			Latrine with permeable slab	

Sub-standard	Latrine is used by members of more than one household	Private. But presence of faecal matter, smell and flies	Latrine with an open pit / no slab	Container with water available, but no soap or ash present
No service	Not used	Not private	Open defecation	No facility – or no water available

Recommendations for programmatic action in Salima

Water

Quantity	Findings suggest that in larger households, average per capita consumption is less than smaller households and below the national standard. Further investigation to understand possible links with health may be worthwhile, particularly focusing on water use for drinking, food preparation, and personal and domestic hygiene.
Quality	Systematic testing and feedback of results to communities should be done. Where quality is compromised, appropriate follow-up action should be taken. Periodic reviews of all results should be done to assess water quality from different water sources.
Access	Further investigations into the causes of poor service quality for MALDA hand-pumps are recommended; including the extent to which spare parts are available and accessible.

Sanitation

Quality	Lessons on low-cost traditional latrines should be learned from the Mzuzu SMART centre and other organisations implementing CLTS and sanitation marketing programmes.
Access	Investigations into the finding that latrines are being constructed within 30 metres of a water point must be undertaken; households must be encouraged to shift latrines and partner staff should be retrained where necessary.
Hand-washing	A review of current best practice regarding triggering and sustaining hand-washing behaviour should be conducted. Findings from the review should be used to inform a revised approach to promoting behaviour change. Alternative designs for hand-washing facilities should be discussed with communities and other organisations implementing WASH programmes.

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