Life-cycle costs approach for WASH services that last

Life-cycle costs in Ghana

Briefing Note 4: Access to water services
in rural areas and small towns

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WASHCost project partners have developed a methodology for costing sustainable water, sanitation and hygiene (WASH) services by assessing life-cycle costs and comparing them against levels of service provided. The approach has been tested in Ghana, Burkina Faso, Mozambique and Andhra Pradesh (India) and Mozambique. The aim of the life-cycle costs approach is to catalyse learning to improve the quality, targeting and cost effectiveness of service delivery.

In Ghana, Kwame Nkrumah University of Science and Technology (KNUST), International Water and Sanitation Centre (IRC), and Community Water and Sanitation Agency (CWSA) are using the WASHCost Life-Cycle Cost Approach to identify the true costs of providing sustainable Water, Sanitation and Hygiene costs in rural and peri-urban areas. This series of briefing notes has been developed to explain the methodology, share the findings, and draw out the implications for policy and practice in the Ghana's WASH sector.

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Front page photo
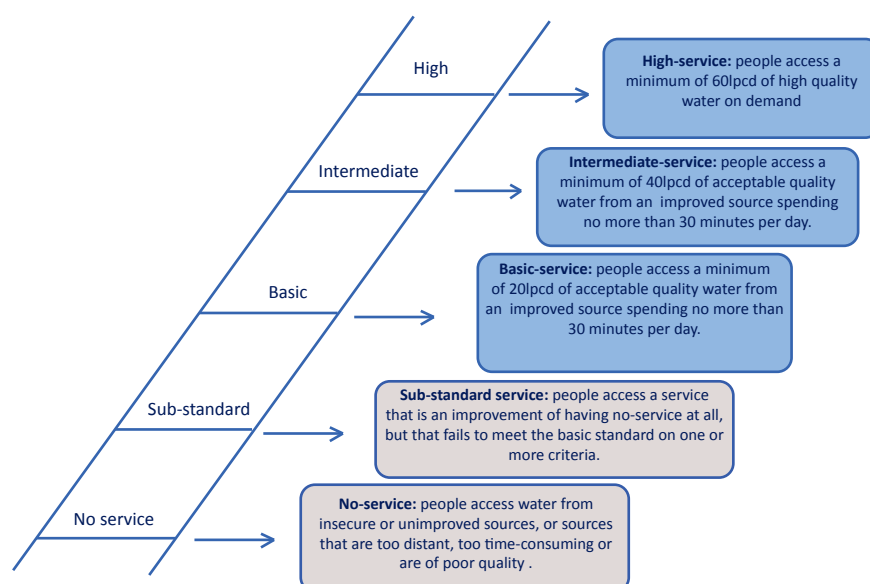IRC-Ghana Team

Life cycle costs in Ghana:

Access to water services in rural areas and small towns

This briefing note reports findings about planned and actual access to water services by users in small towns and rural communities in Ghana. The findings are based on household interviews with water users in Ghana's three main agro-ecological zones. During these visits, the type and level of service to which rural water users had access were identified. The note reports evidence that people's access to services is not always at the level or in the ways assumed by planners.

Thinking in terms of Water Services

Policy commitments to extend coverage with water services are often translated directly into the building of new water infrastructure. When overall water coverage is assessed it is simply based on a multiplication of the number of different water supply facilities by the number of people theoretically served. While this is a good starting point, and while extending coverage does indeed require the construction of water supply facilities, a more useful way to think of water supply coverage is in terms of the **service** being delivered to people by the facilities. This **service** can be thought of in terms of the **quantity** and **quality** of water being delivered, the **reliability** with which it is delivered, and the **accessibility** of the facilities.

The diagram below shows how WASHCost conceptualises access to different levels of service in terms of a 'ladder', each step of which implies an objectively measurable improvement in overall quality of service delivered.

High

High-service: people access a minimum of 60lpcd of high quality water on demand

Intermediate

Intermediate-service: people access a minimum of 40lpcd of acceptable quality water from an improved source spending no more than 30 minutes per day.

Basic

Basic-service: people access a minimum of 20lpcd of acceptable quality water from an improved source spending no more than 30 minutes per day.

Sub-standard

Sub-standard service: people access a service that is an improvement of having no-service at all, but that fails to meet the basic standard on one or more criteria.

No service

No-service: people access water from insecure or unimproved sources, or sources that are too distant, too time-consuming or are of poor quality .

The ladder has been adopted for use in the Ghanaian context by drawing on national guidelines developed by Community Water and Sanitation Agency (CWSA) for rural water supply. These guidelines clearly identify the acceptable standards for service delivery in rural communities and small-towns. According to these standards there are two main levels designed for services in rural Ghana. These levels represent access to either a 'point-system' (a borehole, well or tap-stand) or a household tap, and are shown in Table 1 along with their design norms for quantity, quality, reliability and accessibility. These two levels of rural water service delivery correspond to the 'high' and 'basic' levels of service of the WASHCost ladder. The high level of service is only applicable in small-town piped schemes, where it is generally assumed by planners that approximately 20% of people would make use of it.

Table 1: Ghanaian standards for rural and small-town water services

	Quantity	Quality	Reliability	Accessibility
Rural High	60lcd	GSA norms	95%	On-plot
Rural Basic	20lcd	GSA norms	95%	300/BH,SP <500m 150/W <500m

SP – stand pipe; BH – Borehole; W – Well; Accessibility is measured in terms of the number of people sharing a water point, and the distance of the point from their household.

Research by KNUST and IRC in collaboration with CWSA and other agencies, looked at how the service that rural users actually received compared to these norms and standards. The work visited 31 rural communities with 75 point-systems (boreholes with hand pumps) and 4 small towns in 3 regions. 1,273 people were interviewed in detail about their experience of water services (see WASHCost briefing note 1 for more details on the study methodology adopted).

Table 2 shows functionality data on boreholes with hand pumps from the surveyed communities. This represents whether a borehole was functioning at the time of visit by the survey teams. The overall figure of 71% functional (29% non functional) hides considerable variation between regions.

Table 2: Functionality of boreholes with handpumps

Region (District)	No. of comm-unities	Total point-systems	Non functional systems	Non reliable systems	% function-nality
Ashanti (Bosomtwe)	10	26	4	5	85%
Northern (East Gonja)	15	30	11	11	63%
Volta (Ketu South)	6	19	7	13	63%
Total	31	75	22	29	71%

Tables 3 and 4 show in tabular form the findings of the surveys. The assessment was based on three main indicators: quantity of water used, distance to source, and crowding at source. Quality was not measured as it is not routinely tested for in rural schemes. Crowding at source was only calculated for those sources that were deemed to be reliable: that is, those that function at least 95% of the time.

The tables show the percentage of those users surveyed who are at or above the national standard (standard), below the national standard (sub-standard) or who access no service at all. 'No service' was recorded where people used less than 5l/p/d of water, or where the source was more than 500 m from their household.

When reading the table it is important to understand that to score as being standard for the overall service it is necessary to score as standard on all of the three indicators. This is why the overall score can be different to individual scores for each indicator. This method thus gives a conservative estimate of access to services, based on an assumption that all indicators are equally important.

Table 3 shows scoring on service received for rural point-systems. Overall, 96% of people in the communities had access to some level of improved water service. However, of these only 23% accessed the basic level of service as defined by CWSA. Fully 73% of people surveyed had access to a service that, while better than no service at all, was nevertheless below CWSA standards. Table 3 also shows a considerable range in service levels accessed between the three districts.

Table 3: Rural water point-systems[1] (n = 80)

			Distance	Crowding	Quantity	Overall
Ashanti	Bosomtwe	Standard	**100**	**51**	**62**	**34**
		sub-standard	0	49	32	61
		No service	0	0	6	5
Northern	East Gonja	Standard	**72**	**20**	**62**	**10**
		sub-standard	28	80	33	85
		No service	0	0	5	5
Volta	Ketu South	Standard	**86**	**37**	**57**	**13**
		sub-standard	14	63	39	84
		No service	0	0	4	3
Total		Standard	91	41	61	23
		sub-standard	0	0	34	73
		No service	9	59	5	4

Table 4 shows similar data for the small-town systems that were sampled, and should be interpreted in the same way. The headline finding is that in small-towns 59% of people had a service that met the basic level with 41% falling below this, therefore and having a sub-standard service.

Table 4: Small-town systems (n = 4)

District	STWSS		Distance	Crowding	Quantity	Overall
Bosomtwe	Kuntenase	standard	98	100	74	72
		sub-standard	2	0	26	28
Ketu South	Akame-Kpogedi	standard	84	100	58	46
		sub-standard	16	0	42	54
Kpandai	Bakamba	standard	100	93	73	0
		sub-standard	0	7	27	100
Kpandai	Kpandai	standard	93	0	73	0
		sub-standard	7	100	27	100
	All Small Towns	Standard	90	100	66	59
		Sub-standard	10	0	34	41

It should be noted that, while at the district level, the sample size means these figures can be taken to be reasonably representative (in the statistical sense), the same cannot be said at the regional or national level. Nevertheless, the districts and communities were carefully chosen to be as 'typical' as possible, and the findings are felt to give a good indication of typical conditions in Ghana.

Four main points emerge from the data collected in household surveys:

- There is a high level of 'unreliable' point-systems – albeit showing a wide variation between districts.

- There is a striking difference in the level of service being provided by rural point-systems and small towns: with small towns providing a higher level of service.

- Rural point-systems are providing a service that, for the majority of users, is considerably lower (sub-standard) than intended or designed for.

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[1] Include boreholes with hand pumps and limited mechanised point-systems

- While 73% of people relying on rural point-systems receive a 'below standard' service, nevertheless they do receive some service (with only 4% receiving none at all). In other words, ~95% of people are accessing a minimal amount (more than 5 litres) of good quality water.

Conclusions and emerging questions for policy

The findings are mixed in terms of what they say about rural water service delivery in Ghana. On the one hand, at least 95% of the people surveyed seem to be accessing a minimum quantity of good quality water - and in small towns close to 63% are getting a standard or better level of service. On the other hand, in rural communities fully 73% access either less water than they should, or at a greater distance or with more crowding than is expected – implying more drudgery and time spending for women and children.

The findings of this survey indicate clearly that **small-town piped systems surveyed are providing a service of a considerably higher quality and level than the rural point-systems.** More detailed data (not shown here) shows that about 30% of people in the small towns are actually using more than 40 litres a day – a good level of service for a lower middle income country.

Why are so many people using rural-point-systems getting a relatively lower (sub-standard) level of service? There seem to be several reasons. The first of these is related to the fact that many people are using less than the intended 20lcd of water per day, but that this is not necessarily a fault of the facility. A facility may be capable of providing 20lcd of water, but people may choose not to use this for one or a combination of factors such as cost, ease of access and/or availability of alternatives. Anecdotally, it is well known that many people revert to 'traditional' sources of water when these are available and more convenient. An important question emerging from the research is therefore: **is 20lcd too high a standard for rural point-system supplies; and, should it be possible to modify/relax the standard in different parts of the country?**

A second reason for overall low scores in rural communities is the issue of reliability. The research strictly applied the CWSA norm that a system should function for 95% of the time: in other words a system should be non-functional no more than 18 days in a year. Yet this leads to relatively high levels of systems recorded as being non-reliable. A second emergent question for policy is therefore: **is 95% reliability too high for rural point-systems?**

The third set of reasons for low experienced service relate to accessibility (in terms of distance and crowding). The last two questions emerging from the research are therefore: **should the distance norm of 500m be relaxed? And, should the norm of 300 people per stand-post be relaxed?** Relating to these last, many people feel that the norm of 500m may be too low in some cases – especially scattered rural communities in areas difficult to access groundwater.

Recommendations for policy and practice

In addition to the four questions mentioned, the research has thrown up a number of broader issues that the sector as a whole needs to address and answer. Firstly, the research has demonstrated that assessing actual service accessed by rural people can throw up a number of challenges to assumptions about rural water delivery. **These need to be addressed, and norms and standards for rural (particularly point-source) water supply revisited.**

An important finding of the work is that, in general, none of the rural communities visited relied solely on the point-sources. Rather they use a mix of traditional and improved sources. Building this understanding into rural water supply policy may allow for less stringent norms and thus lower costs of providing services.

Linked to this, the work seems to be broadly positive about the impact of small-town piped schemes. While often criticised as being expensive, the work gave strong backing to the idea that these schemes provide a significantly higher level of service to users. This is an important finding for Ghana as it looks to the future as an increasingly wealthy country.

Linked to both of the previous points, is the need to more explicitly allow for different models and levels of service delivery in different rural contexts. These should be based on a clear set of norms and underlying assumptions, which would help in turn to make planning and budgeting for service delivery more transparent.

Monitoring access to services (rather than simply counting facilities) provides a much more nuanced and accurate measure of whether the water sector in Ghana is achieving its goals – and of where it faces challenges. It is recommended that **those responsible for service provision – the MMDAs and CWSA – start to build service level indicators into their monitoring systems.**

This work was carried out on a limited scale to test a methodology as well as to provide initial indicative results. Although carried out on a sample of over 1,000 people, it has merely scratched the surface. **Additional research is needed to verify (or contradict) the findings reported here in - other parts of the country and particularly in urban setting** where there is currently no similar work to assess actual access to services by urban citizens.

WASHCost briefing note series

Briefing notes relating to survey based work in Bosomtwe, Ketu South and East Gonja

Briefing note 1: Background and Methodology

Briefing note 2: Post-construction costs of water point-systems

Briefing note 3: Costs of rural and small town sanitation services

Briefing note 4: Access to services in rural areas and small towns

Briefing note 5: Access to sanitation services

Briefing note 6: Functionality of rural water point-systems

Briefing note 7: Poverty and access to services

Briefing note 8: Uses and sources of water in rural areas

Briefing notes from desk or case study based work:

Briefing note 9: Case study of twelve small towns in the Central Region

Briefing note 10: Case study of Oyibi multi-village scheme

Briefing note 11: Cost drivers capital investment in small-town pipe schemes

Briefing note 12: Direct support costs to rural WASH service provision

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