Sanitation service levels

Assessing services in rural and peri-urban Mozambique

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Picture on the front page: WASHCost Mozambique

Main findings

WASHCost has developed a range of indicators to cover service levels associated with sanitation facilities and used them to provide a wider ranging and more nuanced assessment of sanitation facilities available to Mozambicans than traditional measures which focus solely on the available toilet technology.

Scoring against these indicators result in one of four service levels (improved, basic, limited and no service) applied to four parameters (access, use, reliability and environmental protection).

Using these wider service level measures, WASHCost's findings from surveys conducted in 2010 regarding sanitation in rural and peri-urban Mozambique suggest the following:

- Access: 7% of rural and 38% of peri-urban Mozambicans have basic access to a sanitation service.
- Use: Unlike the findings of UNDP and others, WASHCost found that 99% of households with latrines used them. Findings with respect to use seem to vary in accordance with definitions of 'use' and of latrines; lower 'use' data is usually understood as 'use of an improved latrine'.
- Reliability: 56% of rural and 58% of peri-urban Mozambicans have access to a reliable sanitation service.
- Environmental protection: All rural sanitation services surveyed were found to have non problematic environmental impacts. This implies that latrines were not seen as a threat to water sources, and the disposal of sludge was not creating significant environmental pollution. In peri-urban areas however, it was difficult to establish the safety of sludge disposal.
- 56% of rural and 71% of urban Mozambicans have access to a limited or basic level of sanitation service, with at least a household latrine, with some type of platform separating users from faeces.
- These four measures can be made into a composite indicator of service. Overall, taking into account these four elements of service, WASHCost figures reveal that 7% of rural and 40% of peri-urban Mozambicans have a basic sanitation service level.

The earlier Mozambique Multiple Indicator Cluster Survey (MICS) found 5.8% of the rural population and 47.1% of the urban population have access to a latrine with a slab (National Statistics Institute, 2008). MICS' findings resonate closely to the composite valuation for the overall service level observed by WASHCost.

The difference between WASHCost service level results and MICS findings on the use of different sanitation technologies could support the assertion that more sophisticated technologies do not necessarily imply better services.

This assertion is further supported by the finding that taking into account the four parameters of access, use, reliability and environmental protection, all technologies aside from traditional latrines, can only achieve a basic service.

These findings support the contention that sophisticated technologies do not necessarily result in better service levels, and that reliability and use are more useful indicators of actual services received.

This Briefing Note describes and discusses these findings in more detail.

1. Introduction

WASHCost is a five-year action research project investigating the costs of providing water, sanitation and hygiene services to rural and peri-urban communities in Ghana, Burkina Faso, Mozambique and India (Andhra Pradesh). The objectives of collecting and disaggregating cost data over the full life-cycle of WASH services are to be able to analyse costs per infrastructure and by service level, and to understand better the cost drivers and, through this understanding, to enable more cost-effective and equitable service delivery. WASHCost is focused on exploring and sharing an understanding of the costs of sustainable services (see www.washcost.info). The aim of the life-cycle costs approach is to help catalyse learning to improve the quality, targeting and cost-effectiveness of service delivery.

In Mozambique, the WASHCost project is being implemented in partnership with the National Directorate of Water (DNA) within the Ministry of Public Works and Housing (MOPH).

The objective of this Briefing Note is to introduce the methodology and findings of a new approach in assessing sanitation service levels. Findings emerged from tests conducted in Mozambique, Burkina Faso, Ghana and India (Andhra Pradesh). Mozambican findings have been analysed from data collected through 1,710 household surveys conducted in six provinces, namely Cabo Delgado, Inhambane, Manica, Maputo city, Nampula and Tete. 1,010 rural and 700 peri-urban/ small city households were surveyed. This note reviews current approaches in monitoring and assessing sanitation service levels, presents an alternative methodology, and analyses findings within the Mozambican context.

In aiming to provide a common framework that is capable of analysing and comparing water and sanitation cost data across different country contexts, with different service delivery norms and standards, the WASHCost research team put to test the analytical and methodological framework set out in WASHCost's Working Paper No. 3 (Potter et al, 2010).

For WASHCost, collecting and understanding the full life-cycle service costs of water and sanitation, requires expanding the examination of costs to include operational, capital maintenance, and direct and indirect support costs. This represents a fundamental shift away from a focus on capital investment costs for water or sanitation facilities or technologies, to also include the costs of sustainable water and sanitation services.

Most approaches to monitoring and measuring sanitation provision focus on the existence of a certain type of latrine[1]. While the type of technology used forms as **one** indicator of a sanitation service, in itself, it is insufficient in fully understanding sanitation **service levels.**

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[1] The terms 'latrine', 'toilet' and 'facility' are used interchangeably in this briefing note.

Table 1 Categories of JMP (2010)

Open defecation

Open defecation: when solid waste or human faeces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces.

Unimproved facilities

Unimproved facilities: do not ensure hygienic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.

Shared sanitation facilities

Shared sanitation facilities: Sanitation facilities of an otherwise acceptable type shared between two or more households. Only those facilities that are not shared or are not public, are considered improved.

Improved sanitation facilities

Improved sanitation facilities: ensure hygienic separation of human excreta from human contact. These makeuse of the following facilities:
- Flush/pour flush to:
  - o   Piped sewer system
  - o   Septic tank
  - o   Pit latrine
- Ventilated improved pit (VIP) latrine
- Pit latrine with slab
- Composting toilet

2. Sanitation coverage and usage data

There are observed differences in figures represented across various literature on access to improved sanitation in rural areas of Mozambique. These range from 40% (UNDP-Mozambique, 2010a) to 4% (WHO/UNICEF JMP, 2010) in rural areas, and between 50% (UNDP-Mozambique, 2010a) to 38% (WHO/UNICEF JMP, 2010) in urban areas (see also Figure 1).

Difference in data coverage is partially explained by diversity in definitions of assessment indicators, minimum standards and terms such as 'access, 'use' and 'improved', which are applied in various monitoring systems, surveys, assessments and studies.

More recent country-wide surveys that were conducted on sanitation coverage in Mozambique are found in the Multiple Indicator Cluster Survey. MICS (2008, p.56) notes that 19.3% of the total population "*uses sanitation services to dispose of excrement, 47.1% of the population in urban areas and 5.8% in rural areas.*"

Other studies have addressed the issue of usage in addition to coverage. As part of its report on the millennium development goals (MDGs), UNDP-Mozambique (2010b) assessed the current status and trends of the rate of use of improved sanitation in Mozambique, arriving at the following conclusions:

"Regarding the aspect of the use of sanitation services, the Multiple Indicator Survey report (2008) provides data showing that in spite of progress in this area, the rates in this area are significantly different from the service access rates introduced earlier.

- *The coverage of the improved sanitation was 12% in 2004 and 19.3% in 2008. The rate of growth of the use of improved sanitation in the country is 1.83% per year, which implies that by 2015 it is possible to reach the coverage of 32.11% in use of improved sanitation. The national target is 50%.*
- *The rate of use of improved sanitation in the rural areas increased from 4% in 2004 to 6% in 2008, i.e., a growth of 0.5% of the rate of use per year. At this speed, by 2015 the country could achieve a rate of use of improved rural sanitation of about 9.5%.*
- *The rate of use of improved urban sanitation was 43% in 2004 and increased to 47% in 2008. This represents a growth of 3.25% per year in this period, implying that at this speed, by 2015 the rate of use of improved urban sanitation will be about 70%.*
- *The use of improved sanitation in Mozambique is larger in the three southern provinces of the country, namely in Maputo, Maputo City and Gaza.*
- *With the exception of Maputo City, which has a rate of use of improved sanitation of 82% for 2007 and 84.6% for 2008, none of the country's provinces has a rate of use of improved sanitation of more than 50%.*
- *With the exception of the provinces of Niassa, Cabo Delgado, Manica and Tete, all the other provinces showed an improvement in the rate of usage of improved sanitation from 2007 to 2008.*
- *The province with the lowest rate of use of improved sanitation was the province of Zambézia with 4.9% usage while in 2008 it was Tete Province, with a rate of 3.4%."*

3. Measuring sanitation coverage data: approaches and problems

The concept of a 'sanitation ladder' originated as a participatory decision-making tool in the 1980's. The WHO/UNICEF Joint Monitoring Programme (2008) adopted the concept of a ladder in developing a global monitoring framework for the achievement of the water and sanitation MDGs. This was achieved by making clear distinctions between 'improved' and 'unimproved' sanitation facilities. For pit latrines for example, the key indicator used in differentiating between 'improved' and 'unimproved' facilities was based on the presence of a cement slab.

The focus has recently shifted from the number of existing facilities to the 'use of facilities'. However, in the JMP report (2010), a strong emphasis remains on the type of latrines or technology options used. In any case, sanitation improvement is however not as straightforward as the concept of a ladder", with incremental improvements from open defecation to full flush, might suggest.

The ranking of appropriate technical options is highly context and location-specific. Variances are described by factors like water availability, soil and groundwater conditions, supply chain realities, settlement densities, types of housing and/or size of plot, etc. In reality, 'higher' or more sophisticated technology options that are not adequately maintained or appropriately operated pose more serious public health and environmental risks, as compared to options lower down the traditional sanitation technology ladder, when managed and used properly.

As noted by Kvarnström et al (2008), the JMP approach has been criticised within the sector because it does tackle service indicators such as quality, reliability and sustainability of water and sanitation. Kvarnström, et al (2008) also notes that by definition, a technology-based approach restricts options to the technologies listed and is not open to other options developed through sector innovation. It also focuses on the 'containment' part of the sanitation service delivery chain, and disregards the issues of disposal, treatment and re-use, or solid and liquid waste management

Building on Kvarnström's concept of functional areas across the sanitation service delivery chain, the WASHCost team has proposed parameters and indicators of sustainable sanitation services across each functional area. Preliminary research findings suggest that this approach is not only useful for the WASHCost research, but can also be adapted by those involved in planning and monitoring sanitation service delivery.

4. Assessing sanitation services: beyond technology

The WASHCost approach introduces a set of globally comparable sanitation *service levels* comprising of service indicators in its analysis and methodology. It goes beyond the investigation of sanitation *technology options* as narrowly set out in sanitation ladders commonly used today.

To WASHCost, a sanitation service is assessed based on the extent by which the elements of the sanitation chain takes up the issues of: (i) containment, (ii) collection, (iii) treatment, (iv) disposal, and (v) re-use of excreta and solid and liquid wastes[2].

The parameters[3] and indicators within each sanitation service level were developed and tested from the perspectives of the user, the provider and the environment, and are based on the principle of 'something better, for all, forever'.

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[2] This briefing note focuses on findings concerning the containment, collection, treatment, disposal and re-use of excreta in Mozambique. Other aspects that are part of sanitation services, such as greywater and solid waste, were assigned different service levels and are not included in this analysis.

[3] Scale and affordability are also important service parameters addressed in this research though data aggregation and analysis.

Table 2 Service parameters of the sanitation ladder

Service Parameters[4]	Service Indicators
Accessibility	Distance from households; effort required for use; safety; privacy[5]; dignity; existence of flies and bad odours; and waiting time for facility use, in the case of communal facilities
Use	Safe and hygienic use by all members of the household, at all times of the day (and evening), and across all seasons; infant faeces disposed in the latrine
Reliability	Effort required for operation and maintenance of the toilet, e.g. pit de-sludging (mechanical) or emptying (manual); operation and maintenance safety for users and service providers; longevity and robustness of top and 'underground' structures
Environmental protection	Environmentally safe containment, collection, treatment, disposal and re-use of excreta and urine; productive re-use of safe by-products.

4.1   Service levels

Based on the above four service parameters and taking into account the following: (i) reality of sanitation services in WASHCost focus countries, and (ii) the functional areas of the sanitation service delivery chain, a sanitation service ladder of four broad categories or levels was developed. The 'limited' service category was included (below basic) in recognition of efforts to achieve an acceptable service level, which technically falls below the JMP basic standard.

The key variables (called service parameters) used to differentiate between service levels were as follows:

Table 3 Key indicators for international service level

Service levels	Accessibility	Use	Reliability (O&M)	Environmental protection (pollution and density)
Improved service	Each family dwelling has one or more toilets in the compound	Facilities used by all household members	Regular or routine O&M (including pit emptying) requiring minimal user effort	Non problematic environmental impact disposal and re-use of safe by-products
Basic service	Latrine with impermeable slab (household or shared), at national norm distance from household	Facilities used by some members of the household	Unreliable O&M (including pit emptying) requiring high user effort	Non problematic environmental impact and safe disposal
Limited service	Platform without (impermeable) slab that separates faeces from users	No or insufficient use	No O&M (pit emptying) taking place and presence of extremely dirty toilet	Significant environmental pollution, rising with increased population density
No service	No separation between user and faeces, e.g. open defecation			

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[4] Service parameters can be thought of as composite service indicators.

[5] This indicator does not refer only to individual household latrines. Privacy is also possible with communal facilities and refers to having a door and walls for privacy and safety.

The two levels of 'acceptable' sanitation service can be described as follows:

Improved service: At this service level, each family dwelling enjoys one or more convenient, private, safe, robust sanitation facility, used by all household members, with minimal effort required for de-sludging and long term maintenance; environmental impact is non-problematic and/ or the re-use of safe by-products is practised.

Basic service: At this level, each household has access -- at national norm distance -- to a safe, relatively robust sanitation facility with an impermeable slab, used by most members of the household, with relatively weak desludging and other long term maintenance provisions, and non problematic environmental impact or safe disposal of sludge. This is typical of most improved rural and peri-urban sanitation services, and aligns with the JMP standard for 'basic', except describing the slab as 'impermeable' rather than cement.

Given the proliferation of traditional latrines in many developing countries including Mozambique and reported progress in ending open defecation, a 'limited' service level was included. A limited service level refers to a condition in which households have access to a latrine with a platform (of any material) separating faeces from the user.

4.2   Service parameters

While an overall service level per household was decided based on the lowest score across the four key service parameters outlined in Table 3 above, the use of this approach goes beyond simply assigning a service level to a facility. The application of the approach enables researchers and planners to assess service levels per household in a particular area, within each service parameter (i.e. access, use, reliability and environmental protection). It also provides for a richer and more nuanced picture of sanitation services in sample areas. For example, working with service levels enable sanitation planners to see that within area X, Y% of the households have basic service levels with respect to accessibility, however, a Z% basic service level may be observed when use, reliability or environmental protection are being explored.

5. Findings: sanitation service levels in Mozambique

5.1 Overall

The service level approach was used as a framework for analysing data gathered during the 2010 WASHCost survey. The survey was conducted by trained enumerators in six provinces, implementing the same sampling methodology applied by MICS (WASHCost Mozambique, 2010).

The study started with a scoping exercise that mapped out findings linked to the analysis of conventional sanitation coverage -- defined by technology type (Figure 1). In rural areas, an increase in sanitation coverage between the years of 2007 and 2010 was reported. However, an increase in the number of improved latrines was minimal. In contrast to this, a first glance into the reported figures for peri-urban areas suggests that there had been a decrease in coverage between 2008 and 2010. Such an assessment is however quite simplistic and requires further reflection as the INE and MICS cover all urban areas. In comparison, WASHCost sample coverage is limited to peri-urban areas (defined as poor areas within the urban territory). WASHCost coverage does not include the city centres (*bairro cimento)* which typically have significantly higher sanitation coverage. WASHCost's estimate of 75% coverage in 2010 should therefore be regarded as coverage for the peri-urban areas in the six provinces of Mozambique.

| Rural coverage | Peri- urban coverage |
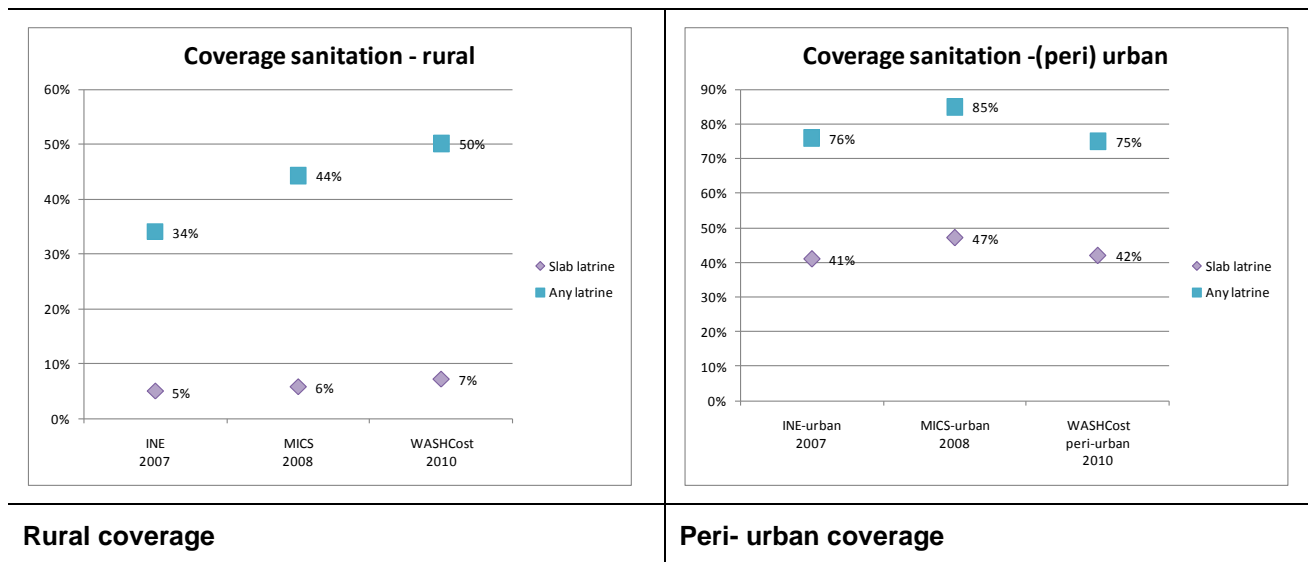
Figure 1 WASHCost coverage in comparison with historical data

The results of the assessment for the four service level parameters are provided in the succeeding sections. The methodology used to derive the results is provided first in each case, and is illustrated using a simple decision flowchart to reflect the processes used. The results are then provided, and any caveats or challenges requiring to be noted are highlighted.

5.2 Accessibility

Assessment of accessibility was designed to provide a measure of the distance of latrines from households, effort required for use, safety, privacy, dignity, minimises flies and bad odours, and waiting time in the case of communal facilities.

Data on accessibility was qualified based on three key as collected during the survey. The first level is determined by technology: open defecation (bucket, bush, beach, cat method). The second level is determined by location and the third, by the presence of slab. This is visualised in Figure 2.

The selection of these indicators point to the fact that not all aspects of the original ladder were taken into account as initially designed (Table 3). For instance, Mozambique does not have a distance norm in its sanitation policy and therefore this indicator was not considered.

Figure 2 Flow chart for Accessibility parameter

Further, some variables were adjusted. For instance, the MIC indicator 'multiple latrines per household' was not considered as an indicator for improved service levels in the WASHCost analysis. For WASHCost, the presence of a latrine in one's house is regarded as sufficient for a standard household of five. Another indicator adapted in the WASHCost analysis is 'usage of a neighbour's traditional toilet' – such is not considered an access to a service.
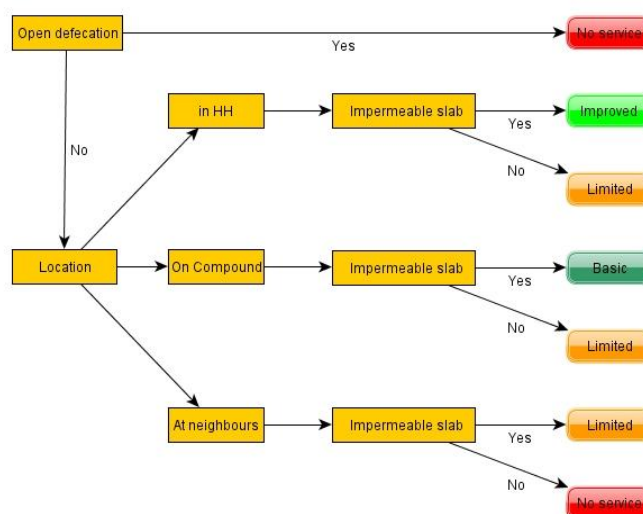
These adaptations resulted in the accessibility values presented in Table 4.

Table 4 Access service parameter

	Rural	Peri-urban	Total
Improved	0.1%	1.7%	0.8%
Basic	6.8%	38.4%	19.8%
Limited	50.4%	34.4%	43.9%
No service	42.7%	25.4%	35.6%

The indicators in this service parameter most closely approximate the indicators used by the MICS survey (2008), which used the presence of a slab to differentiate between improved or unimproved facilities. MICS indicated 6% and 47% for rural and urban respectively (Figure 1).

WASHCost found that 7% of rural households had access to a latrine with a slab within easy access; and 40% for peri-urban households. Access service levels per technology type are set out in Table 5.

Table 5 Technology and access service level

Technology	Improved	Basic	Limited	No service	Grand Total
Septic tank	26.0%	74.0%	0.0%	0.0%	100.0%
VIP latrine	0.0%	100.0%	0.0%	0.0%	100.0%
Slab latrine	0.0%	94.7%	5.3%	0.0%	100.0%
Traditional improved latrine	0.0%	94.4%	5.6%	0.0%	100.0%
Traditional latrine	0.0%	0.3%	99.7%	0.0%	100.0%
Dig and bury	0.0%	0.0%	0.0%	100.0%	100.0%
Bucket	0.0%	0.0%	0.0%	100.0%	100.0%
Open defecation	0.0%	0.0%	0.0%	100.0%	100.0%
Grand Total	**0.8%**	**19.8%**	**43.9%**	**35.6%**	**100.0%**

5.3   Use

'Use' of the latrine was assessed based on self-reporting, and the observation of proxy indicators such as the presence of faeces in the pit, presence of smell, wet slab, and evidence of anal cleansing materials. The vast majority (99%) of latrines were reported and observed to have been used.

A shortcoming of the survey was that latrine use had not been specified per household member. Consequently, the data did not provide any viable selection to differentiate between 'All' (improved service) and 'Some' (basic service). Therefore, all households reporting to have and use a toilet were categorised as 'Some' and consequently as accessing 'basic' service levels (Table 6). This had led to a oversimplified assessment of all latrines being considered as having a basic service level of use. This is scheduled to be addressed during a specific survey in 2012.
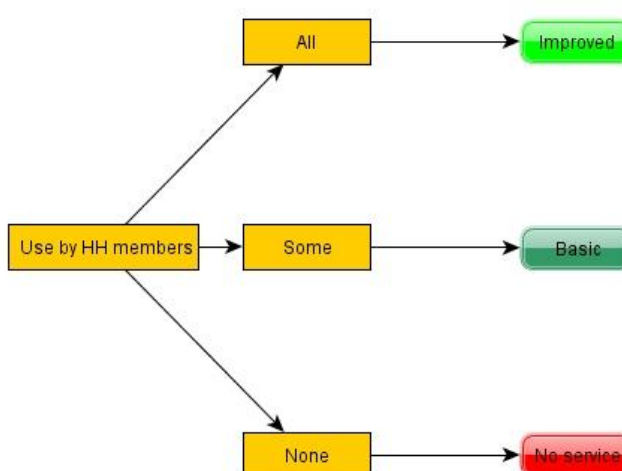
Figure 3 Flow chart for Use parameter

Table 6 Use parameter

Technology	Basic	No Service
Septic tank	100%	0%
VIP latrine	100%	0%
Slab latrine	100%	0%
Traditional improved latrine	100%	0%
Traditional latrine	100%	0%
Bucket	0%	100%
Dig and bury	0%	100%
Open defecation	0%	100%

5.4 Reliability

Assessment of the reliability parameter of sanitation services was designed to provide a measure of the effort required for a toilet's operation and maintenance, e.g. pit de-sludging (mechanical) or emptying (manual), in addition to examining the general condition of the toilet.

Reliability is the most innovative parameter introduced by WASHCost, and therefore it is important to understand how such may be applied. In WASHCost, measuring reliability is based on two indicators:

Figure 4 Flow chart for Reliability parameter

- *Pit latrine services available in the community:* if any of the sampled household in the community indicated that they paid for latrine emptying (and thus a service exists), then all sampled households in the community received the category 'basic'. If more than half of the households had used a service, these households were categorised as 'regular'.
- *Very dirty latrines cannot be regarded as providing a service*, and obviously do not receive O&M service.
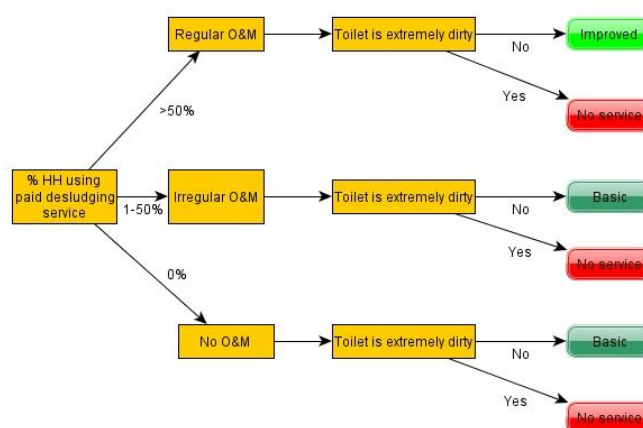
Two communities in peri-urban Maputo were categorised as having a regular O&M service while 12.4% of all peri-urban households were reported to have improved O&M services (Table 1). All these were located in two *bairros* in peri-urban Maputo. The rest of the latrines were categorised as 'basic' in terms of reliability. Open defecation was not considered a service at all (Table 8). About 2-5% of the latrines were found to be very dirty and consequently, received a 'no service' classification.

Table 7 Reliability parameter

Service level	Rural	Peri-urban	Grand Total
Improved	0.0%	12.4%	5.1%
Basic	55.9%	58.4%	57.0%
No Service	44.1%	29.1%	38.0%

An interesting observation was also arrived at in examining sanitation technology through the lens of reliability where most advanced technologies (septic tanks and VIP) were found to only offer basic service levels. This is attributed to the relatively limited access to latrine emptying in peri-urban areas. Furthermore, 2-5% of all basic latrines were found to very dirty, as such, constitute a 'no service' classification.

Table 8 Reliability with technology

Technology	Improved	Basic	No Service
Septic tank	38.0%	62.0%	0.0%
VIP latrine	42.1%	57.9%	0.0%
Slab latrine	24.3%	74.1%	1.6%
Traditional improved latrine	4.7%	91.6%	3.7%
Traditional latrine	1.2%	94.3%	4.5%
Dig and bury	0.0%	0.0%	100.0%
Bucket	0.0%	0.0%	100.0%
Open defecation	0.0%	0.0%	100.0%
Grand Total	**5.1%**	**57.0%**	**38.0%**

On the whole, pit emptying services and improvements in household use and maintenance were found to be more prevalent where sophisticated technology options such as VIP latrines, septic tanks, and slab latrines exist.

5.5   Environmental protection

The environmental parameter is based on two indicators as shown in Figure 5. The second indicator, reuse, was not found applicable in the context of Mozambique due to very low numbers of ecological latrines.

In WASHCost's overall assessment, all sanitation services surveyed in rural areas were categorised to have a non problematic environmental impact. This implies that the disposal of sludge was not creating any significant environmental pollution.
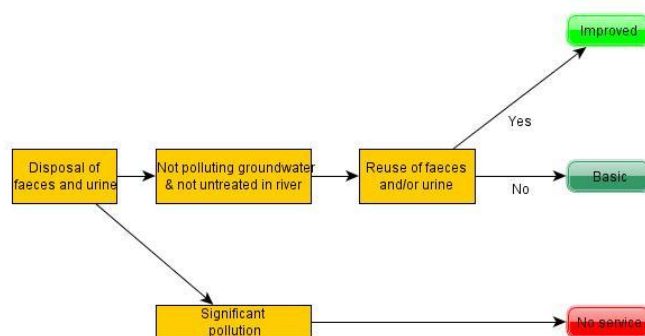
Figure 5 Flow chart for Environmental parameter

This simplified approach has also been applied in peri-urban settings, though WASHCost has been unable to identify and categorise the disposal locations of all peri-urban settlements.

Table 9 Environmental parameter

Environmental parameter	Rural	Peri-urban	Grand Total
Basic	57.3%	74.6%	64.4%
No service	42.7%	25.4%	35.6%

5.6   Overall service levels

The analysis of each of the parameters covers a variety of indicators. Taking all the parameters of a service into account (accessibility, reliability, use and environmental protection), an overall service level has been established. Although aggregating these parameters into a single score simplifies the complexity and richness of the analysis, a single service level can be established when the lowest service level is used as the decider. No household was found to receive improved services on all parameters and consequently, no improved overall service level was encountered in the entire sample.

Table 10 confirms that there is a big gap between peri-urban and rural areas, where 5 times more people in peri-urban areas are found to receive a basic service in comparison to those living in rural areas. Limited service levels are however still common throughout -- particularly in rural settings.

Table 10 Overall service levels

Service level	Rural	Peri-urban	Grand Total
Basic	7%	40%	20%
Limited	49%	31%	42%
No service	44%	29%	38%

Table 11 shows that there is a clear correlation between technology and received services. However, data also reveals that 5% of the traditional latrines dropped to the category 'no service'. Most significantly, septic tanks and VIPs had also been found as failing to go beyond the basic level.

Table 11 Technology and overall service levels

| Technology	Basic	Limited	No service	Grand Total
Septic tank	15%	0%	0%	3%
VIP latrine	6%	0%	0%	1%
Slab latrine	51%	1%	0%	11%
Traditional improved latrine	28%	1%	1%	6%
Traditional latrine	1%	98%	5%	43%
Bucket	0%	0%	0%	0%
Dig and bury	0%	0%	32%	12%
Open defecation	0%	0%	62%	24%
Grand Total	**100%**	**100%**	**100%**	**100%**

5.7   Service delivery approach and service level

Sanitation service delivery approaches in rural Mozambique generally constitute various approaches of Participation, Education and Community mobilisation (PEC) to stimulate demand for improved sanitation and promote hygienic practices. These can be broadly categorised in PEC traditional and PEC Zonal (with Community-led Total Sanitation, CLTS).

When exploring service levels per Province (Table 12, Figure 6), the highest levels were found in urban Maputo. Interestingly however, Manica and Tete, both rural provinces, followed urban Maputo. These two have both been benefitting from the large One Million Initiative and have partly been recipients of CLTS programmes and PEC Zonal.

Table 12 Service level and Province

Province	Basic	Limited	No service
Maputo city	77%	17%	7%
Manica	20%	36%	45%
Tete	15%	37%	48%
Nampula	11%	31%	58%
Inhambane	9%	53%	38%
Cabo Delgado	5%	74%	21%
Grand Total	**20%**	**42%**	**38%**
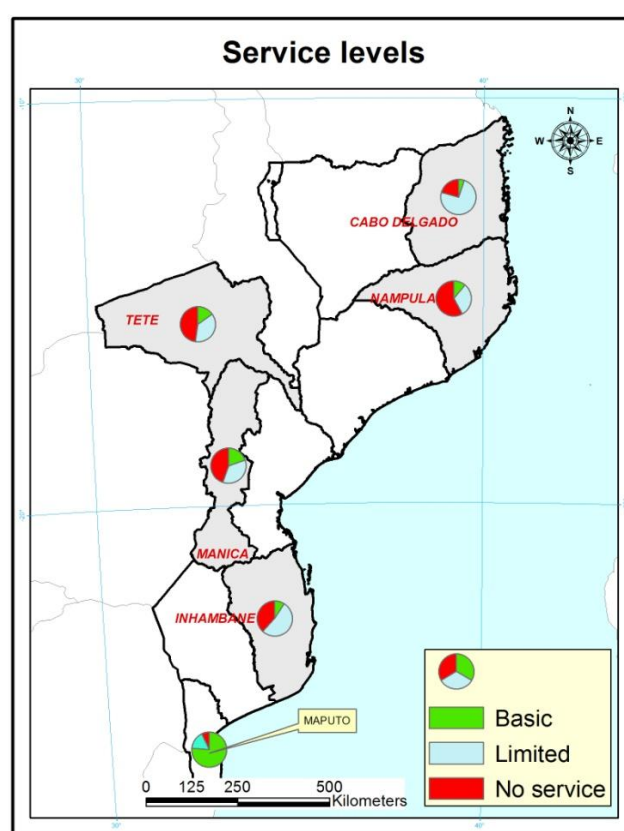
Figure 6 Service level per Province

6. Summary and discussion

Overall, these findings suggest that 56% of rural Mozambicans and 71% of urban Mozambicans have access to a limited or basic level of sanitation service, with the existence of a household latrine, with some sort of platform separating users from faeces.

In contrast to this, the MICS (2008) report found that 5.8% of the rural population and 47.1% of the urban population of Mozambique have access to a latrine with a slab. The difference between WASHCost service level results and MICS findings on the use of different sanitation technologies could support the assertion that more sophisticated technologies do not necessarily imply better services. This is further supported by the finding that -- taking all into account: accessibility, use, reliability and environmental protection assessment parameters -- all technologies (aside from traditional latrines), only achieve a basic service.

These findings support the contention that sophisticated technologies do not necessarily result in better service levels, and that reliability and use are important indicators to measure actual services received. Findings also trigger the question *how improved service levels can be achieved*. The availability of more hygiene awareness and latrine emptying services would contribute significantly towards improving service levels. WASHCost has earmarked these items for more detailed follow-up study in 2012.

7. Conclusions and recommendations

As is well known in the Mozambican sector, access to acceptable sanitation services is low, particularly for the rural poor. There is an urgent need to strengthen sanitation service delivery targeting the rural poor for improved systems and structures, to ensure more equitable service delivery.

A poorly maintained, unhygienic latrine is found to not result in intended health benefits, regardless of its technical sophistication. These finding point to the need for strengthening user education regarding hygiene latrine maintenance in PEC and CLTS interventions, and the need for increased monitoring processes, follow up and support after latrines are constructed.

71% of urban Mozambicans have access to a limited or basic level of sanitation service, with at least a household latrine with some sort of platform separating users from faeces. While it is acknowledged that, from a public health perspective, open defecation in dry, sparsely populated settlements is preferred over an unimproved pit latrine, this assumption cannot hold true in dense or wet conditions. Unimproved pits were included as a less than basic/ acceptable service level as, at minimum, they provide a platform to separate faeces from the user. 58.4% of household latrines in peri-urban areas were found to be reasonably well maintained, with households having irregular access to a pit emptying service.

In order to better understand the status quo of existing services and therefore plan for effective service delivery improvements, it is important to measure service parameters such as reliability and use in addition to access, as this provides a more nuanced picture of where the problems lay, which need to be addressed, how better investments can be made, and how to strengthen equitable and sustainable sanitation service delivery. It is recommended that national monitoring systems, tools and indicators be harmonised and incorporate the collection of reliability and environmental protection data.

Although WASHCost focuses on the financial costs of WASH services, a recent publication of WSP-Africa (2011) points out that Mozambique loses 3.5 billion Meticais (US $ 124 million) each year, the equivalent of US $6 per person in Mozambique per year or 1.2% of the national GDP.

This current study endorses the recommendations made by WSP-Africa (2011: p4):

- *"Higher investments are allocated to sanitation and hygiene promotion in Mozambique.*

- *Bottlenecks in the service delivery pathway be addressed.*

- *Investments need to be targeted to the poorest.*

- *Addressing open defecation be prioritized and scaled up."*

8. References

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