



Providing a basic level of water and sanitation services that last: COST BENCHMARKS

Over the past four years, WASHCost teams in Burkina Faso, Ghana, Andhra Pradesh (India) and Mozambique have collected, validated and analysed cost and service level information for water, sanitation and hygiene.

This Infosheet provides an overview of the minimum benchmarks for costing sustainable basic services in developing countries. They have been derived from the WASHCost dataset and the best available cost data from other organisations all over the world. They are therefore based on the most comprehensive and comparable data on water costs and service levels available for developing countries in rural and peri-urban areas. The benchmarks are useful for planning, assessing sustainability from a cost perspective and for monitoring value for money.

WASHCost research shows that the local context is highly significant in determining costs in developing countries. Many social, institutional and political aspects influence the level of services and value for money. However, we can say with some confidence that if expenditure is much lower than the benchmarks presented here, then the services being planned or delivered have a high probability of being unsustainable. Costs are one of the key factors to ensure sustainability.

What costs have been considered?

Adopting a life-cycle costs approach requires that all aspects of a service are considered and costs are catered for from construction to operation, rehabilitation and eventual replacement of infrastructure. It is all of these costs taken together that cover the total cost of providing a sustainable level of service.

Further reading on cost components, please see Briefing Note 1a.

What is considered a basic level of service?

The life-cycle costs approach adopted by WASHCost measures a service based on a combination of different criteria, such as access, quantity, use, quality and reliability. These criteria and their sub-indicators vary according to

country context and norms. The service level framework can easily be adapted to country and organisation norms. For international comparison of rural and peri-urban areas (including slums) and for small towns, we use criteria and indicators agreed across the four WASHCost countries.

For **water supply services**, a basic level of service is achieved when all the following criteria have been realised by the majority of the population in the service area: People access a minimum of 20 litres per person per day, of acceptable quality (judged by user perception and country standards) from an improved source which functions at least 350 days a year without a serious breakdown, spending no more than 30 minutes per day per round trip (including waiting time).

For **sanitation service levels**, a basic level of service is achieved when all the following criteria have been achieved by the majority of the population in the service area: At least some members of the household use a latrine with an impermeable slab available at the house, in the compound or shared with neighbours. The latrine is clean even if it may require high user effort for pit emptying and other long-term maintenance. The disposal of sludge is safe and the use of the latrine does not result in problematic environmental impact.

Further reading on service levels please see Working Papers 2 and 3.

For more information, visit the website www.washcost.info or contact us by e-mail at washcost@irc.nl.

Cost benchmarks for basic water service levels

The following benchmarks indicate the costs for providing a basic level of water service.

They suggest that the capital costs of preparing and installing a borehole and handpump (at 2011 prices) range from US\$ 20 per person to just over US\$ 60 per person.

For small schemes, including mechanised boreholes and piped supplies, the costs range from US\$ 30 to just over US\$ 130 per person. For intermediate and larger schemes capital costs vary widely from US\$ 20 to US\$ 152 per head.

Recurrent costs (covering operation and maintenance, capital maintenance and direct support) range from US\$ 3-6 per person per year for boreholes and handpumps, and from US\$ 3-15 per person per year for piped schemes.

- i) If expenditure is lower than the minimum range, then there is higher risk of reduced service levels or long-term failure. A reduced service level means that one or more of the criteria is not achieved. In the WASHCost research, quantity and reliability criteria tend to score lower when recurrent expenditure is low.
- ii) If expenditure is higher than the maximum range, an affordability check (for both users and providers) might be required to ensure long-term sustainability.
- iii) If a basic level of service is being delivered AND expenditure is outside the cost benchmarks, then there may be context-specific explanations; such as the service is in a densely-populated area with economies of scale, or, conversely, the area is difficult or remote to reach.

Table 1a Capital and recurrent expenditure benchmarks for water services

Cost component	Primary formal water source in area of intervention	Cost ranges [min-max] in US\$ 2011
Total capital expenditure (per person)	Borehole and handpump	20-61
	Small schemes (serving less than 500 people) or medium schemes (serving 500-5,000 people) including mechanised boreholes, single-town schemes, multi-town schemes and mixed piped supply	30-131
	Intermediate (5,001-15,000) or larger (more than 15,000 people)	20-152
Total recurrent expenditure* (per person, per year)	Borehole and handpump	3-6
	All piped schemes	3-15

*See breakdown below (Table 1b).

Table 1b Breakdown of recurrent expenditure benchmarks for water services

Breakdown of recurrent expenditure*	Cost ranges [min-max] in US\$ 2011 per person, per year	
	Borehole and handpump	All piped schemes
Operational and minor expenditure	0.5-1	0.5-5
Capital maintenance expenditure	1.5-2	1.5-7
Expenditure on direct support	1-3	1-3
Total recurrent expenditure	3-6	3-15

*'Cost of capital' and 'expenditure on indirect support' are not included in Table 1b owing to insufficient and unreliable sources of information. However, note that total recurrent expenditure is significantly less than total capital expenditure (Table 1a).

For further reading on water costs and service levels, please see Working Paper 8.

Cost benchmarks for basic sanitation service levels

Extensive household surveys across the four WASHCost countries provide a bleak picture on the use and reliability of existing sanitation services. There is therefore much less data available on the expenditure required to provide a basic sanitation service. The cost benchmarks presented here are derived from three key sources: the WASHCost database for capital expenditure and operational

expenditure; the database of one of the largest sanitation implementation programmes in the world for expenditure on direct support; and finally, for expenditure on capital maintenance, a study by Chowdhry, S. and Kone, D. in 2012: *Landscape and business analysis for FSM emptying and transportation in Africa and Asia: final project report for the Bill & Melinda Gates Foundation*.

The figures suggest that the cost of preparing and building a traditional pit latrine with an impermeable slab (at 2011 prices) range from US\$ 7 - 26 per person. Pit latrines with impermeable or concrete slabs and VIP latrines range from US\$ 36 to more than US\$ 350 per person. Pour flush or septic tank latrines range from about US\$ 90 - 350 per person.

Recurrent costs (covering operation and maintenance, capital maintenance and direct support) range from US\$ 1.5 for low-cost pit latrines per person per year to US\$ 11.5 per person per year for the most expensive pour-flush or septic-tank latrines.

- i) If expenditure is lower than the minimum range, then there is higher risk of reduced service levels or long-term failure. A reduced service level means that one or more of the criteria is not achieved. In the WASHCost research, use of latrines and reliability criteria tend to be lower when recurrent expenditure is low.
- ii) If expenditure is higher than the maximum range, an affordability check (for both users and providers) might be required to ensure long-term sustainability.
- iii) If a basic level of service is being delivered AND expenditure is outside the cost benchmarks, then there may be context-specific explanations; such as the service is in a densely-populated area with economies of scale, or, conversely, the area is difficult or remote to reach.

Table 2a Capital and recurrent expenditure benchmarks for sanitation services

Cost component	Latrine type in area of intervention	Cost ranges [min-max] in US\$ 2011
Total capital expenditure (per person)	Traditional pit latrines with an impermeable slab (made often from local materials)	7-26
	Pit latrines with a concrete impermeable slab, or VIP type latrines with concrete superstructures (with ventilation pipe and screen to reduce odours and flies)	36-358
	Pour-flush or septic-tank latrines, often with a concrete or bricked lined pit/ tank with sealed impermeable slab, including a flushable pan	92-358
Total recurrent expenditure* (per person, per year)	Traditional pit latrines with an impermeable slab (often made from local materials)	1.5-4.0
	VIP type latrines	2.5-8.5
	Pour-flush or septic -tank latrines	3.5-11.5

*See breakdown below (Table 2b).

Table 2b Breakdown of recurrent expenditure benchmarks for sanitation services

Breakdown of recurrent expenditure*	Cost ranges [min-max] in US\$ 2011 per person, per year		
	Traditional pit	VIP type latrines	Pour-flush or septic-tank latrines
Operational and minor expenditure	0.5-1	1-4	1-4
Capital maintenance expenditure	0.5-1.5	1-3**	2-6**
Expenditure on direct support***	0.5-1.5	0.5-1.5	0.5-1.5
Total	1.5-4	2.5-8.5	3.5-11.5

*'Cost of capital' and 'expenditure on indirect support' are not included in Table 2b owing to insufficient and unreliable sources of information. However, note that total recurrent expenditure is significantly less than total capital expenditure (Table 2a).

**Based on pit emptying figures derived from Chowdhry and Kone, 2012. Figures used for pit emptying assume that traditional VIP type latrines require emptying every five years, and pour flush/ septic tanks every two years. These figures may be adapted to context-specific situations.

***Derived from a soon-to-be published dataset from a large implementation programme in the sector.

Further reading on sanitation costs and service levels, please see Briefing Note 3.

We believe these benchmarks to be the best available, providing reliable guidance for planning, implementing and monitoring WASH services. However they cannot be regarded as precise for every setting, as local factors must

be taken into account. For example, the lower cost ranges were generally, but not always found in India, while cost data from Latin America tends to be higher than the maximum ranges, but usually relates to higher service levels.

WASHCost materials for further reading

- Briefing Note 1a** Life-cycle costs approach: costing sustainable services
<http://www.washcost.info/page/1557>
- Working Paper 2** Ladders for assessing and costing water service delivery (Second edition)
<http://www.washcost.info/page/753>
- Working Paper 3** Assessing sanitation service levels (Second edition)
<http://www.washcost.info/page/902>
- Working Paper 8** Assessing the life-cycle costs approach to water: costs and service levels in Andhra Pradesh (India), Burkina Faso, Ghana and Mozambique
Forthcoming in 2012
- Briefing Note 3** Assessing the life-cycle costs approach to sanitation: costs and service levels in Andhra Pradesh (India), Burkina Faso, Ghana and Mozambique
<http://www.washcost.info/page/1626>

Visit the WASHCost website at www.washcost.info or IRC's WASH library at www.washdoc.info.nl to access global and country-specific publications and research materials.



WASHCost

The life-cycle costs approach is a methodology for monitoring and costing sustainable water, sanitation and hygiene (WASH) services by assessing costs and comparing them against levels of service provided. The approach has been tested in Burkina Faso, Ghana, 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.

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