

Introduction to District/ Local/ Area wide Life Cycle Costing

This document aims at providing a rapid introduction to the use of life cycle costing approach to support in the process of costing and identifying funding sources of a district / area wide plan with consideration of long-term sustainability of WASH services and behaviours.

The document is for:

- *WaterAid country programme teams working on supporting local governments in improving their planning and budgeting processes*
- *WaterAid policy and advocacy teams to support promoting integration of LCC as a key approach in local and national planning and budgeting processes*
- *Local governments working on their planning and budgeting to provide some background on LCC approach.*

What is Life Cycle Costing (LCC)?

Using a Life Cycle Costing approach in WASH refers to the assessment of ALL costs necessary for delivering and *SUSTAINING* in long term water, sanitation services and hygiene behaviours to a specific population.

Life cycle costs include not only the initial, often one-off costs of installing new infrastructure or promoting practices, but also the short and long-term costs of maintaining and supporting these services and behaviours long into the future. Some examples of these costs are spare parts for minor and major maintenance or replacement, water or sanitation officer/technician salaries, local area mechanics, recurrent technical training of national and sub-national water and health staff, repeat sanitation and hygiene promotion, ongoing monitoring etc.

Why is LCC it important?

While operation and minor maintenance is often planned for, larger replacements or behaviour reinforcements are often omitted from local and national planning and budgeting. This is a key reason, although not the only one, that lead to services breakdown, low functionality rates, behaviours slippages and therefore to low service levels provision or low behaviours sustainability. For this reason, these costs need to be known and understood by the service provider, district, provincial and national-level entities responsible for WASH service delivery. **Without inclusion of these costs in budget lines and planning, sustainability of services and behaviours cannot be achieved.** The modelling of these costs for different scenarios (e.g. different technology choices, management models, promotion approaches) and its comparison with funding flows available can also aid in **decision making and the selection of appropriate and sustainable service delivery models/approaches** to ensure long term financial sustainability.

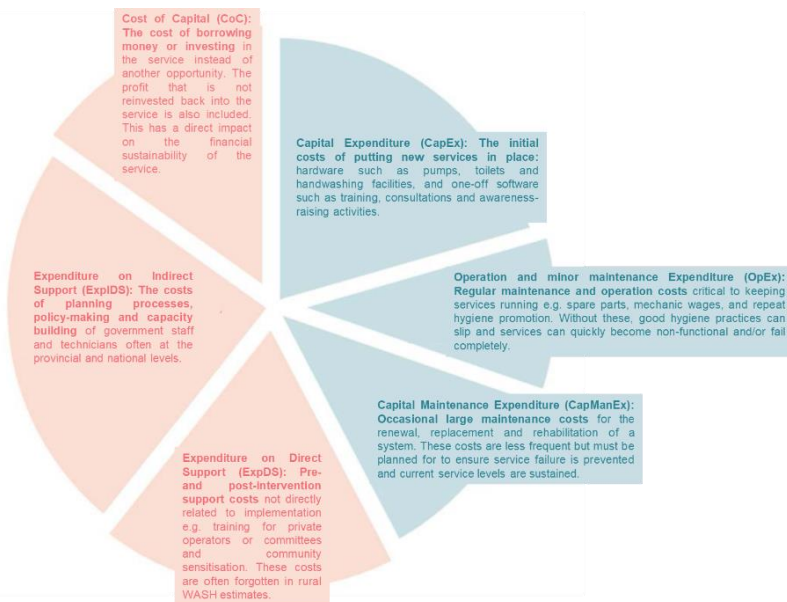


Figure 2: The six life cycle cost components adapted from WashCOST, IRC-WASH 2016.



Figure 1. Golocho, Oromia, Ethiopia Local Government staff calculating costs for sustainable and universal water access in rural communities (2018)

What are the different Life Cycle Costs components?

Cost component	Description	Frequency of cost
Capital Expenditure (CapEx) Hardware and Software	<p>Initial cost of investment to provide a new service or introduce behaviours. The CapEx Hardware is the capital invested in constructing fixed assets such as concrete structures, pumps, tanks and pipes. Investments in fixed assets include the costs of initial construction and system extension or enhancement.</p> <p>The CapEx Software includes one-off activities that support the delivery of W&S services or hygiene behaviours such as costs of one-off hydrogeological assessments, capacity building, formative research, campaign materials printing, etc.</p>	At construction / beginning of programmes
Operation and minor maintenance Expenditure (OpEx)	<p>Ongoing costs Refers to the ongoing expenditure to deliver services or promotion: fuel, chemicals, consumables. Minor maintenance includes costs for routine maintenance needed to keep services running at peak performance but does not include major repairs.</p> <p>Most cost estimates assume OpEx runs at between 5% and 20% of capital investments. For water, these costs are generally covered by revenues from tariffs by users.</p>	Yearly cost
Capital Maintenance Expenditure (CapManEx):	<p>Large maintenance / replacements of initial investment CapManEx includes the costs associated with the activities beyond routine maintenance and include large replacement of equipment or software components such as refresher trainings, material re-reprint to keep WASH services running and sustain hygiene behaviours. Responsibilities for the funding of these costs are often unclear and therefore important to assess and plan for.</p>	Every X n of years based on life cycle
Expenditure on Direct Support (ExpDS)	<p>On-going costs for support activities by local authorities Includes expenditure on post-construction support activities - for example monitoring (service performance and water quality), technical support etc. These costs include ensuring that local government staff have the capacity and resources to help communities when services break down or to monitor private sector service providers. Costs in addition to staff time are usually overlooked including transport, per diems etc.</p> <p>In utility / private management of services, expenditure on direct support such as overheads is usually included in OpEx.</p>	Yearly cost
Expenditure on Indirect Support (ExpIDS)	<p>On-going support activities from national level government This includes macro-level support, planning, regulation and policy making that contributes to the service environment but is not particular to any programme or project. Indirect support costs include: developing and maintaining frameworks and institutional arrangements, regulatory processes and capacity-building for professionals and technicians.</p> <p>These costs are usually not included in district planning as they are included in national budgets.</p>	Yearly cost
Cost of Capital (CoC)	<p>Cost for loans The cost of capital is included when there are loan repayments that need to be paid for regularly (e.g. past large loans on WASH infrastructure) at local or national level (with local contributions). In the case of private sector investment, the cost of capital will include an element distributed as dividends.</p>	Yearly cost

How to calculate the area-wide life cycle costing? What data is needed?

A district/ area-wide life cycle costing analysis for WASH services and behaviours aims to provide a long-term costing overview to inform better planning. If it is done for long periods (e.g. more than 3-4 years), the estimates for years after 3-4 do not have to be based on detailed calculations (e.g. no need for detailed engineering designs). Rather, the estimates aim to provide order of magnitudes of different costs components to inform relevant Ministries budgets trends.

The process includes the following activities:

1. Engage with local government water and health staff, together with finance staff and WASH service providers to understand existing W,S&H or district wide planning and budgeting processes and introduce LCC approach to support the costing process.
2. Collect (if not already available) and analyse current household and institutional (e.g. schools, healthcare facilities) WASH coverage and service levels (in line with national standards and global WASH JMP indicators). Compile a detailed WASH assets inventory¹. *[Overall detailed data needs in table below]*
3. For areas or communities with no services or with low hygienic behaviours, or where upgrades are needed: identify all the hardware and software cost components required to cover gaps in services and behaviours (CAPEX). Average or range of infrastructure and activity unit costs can be used to inform calculations.
4. Collate data on average annual optimal operational costs (OPEX) for water and sanitation services and for continuous behaviours promotion. Consider not only the current operational costs but all but all costs that would ideally be required to ensure service levels and behaviours (ideal scenario costs)
5. Identify current replacement needs based on current status of existing infrastructure and predict future replacement needs of current or planned assets based on average life of each asset type (see more details below) or frequency of repetition of software activities (CapManEx)
6. Identify the ideal support functions needed to ensure services last (this is dependent on management model introduced): technical supervision and support, monitoring, trainings etc and staff and other logistics costs associated with these (Direct Support costs)
7. With support of calculation tools, model possible future scenarios based on different technology solutions and management models and assess how much each scenario costs. Different **tools** exist that can support quicker and automatic calculation and modelling of long-term cost components.

Data needed for district WASH costing using LCC approach		
Activity category	Cost	Detailed data needed
Water Supply		
Infrastructure type (& Service levels to be provided)	Single / Piped system with distribution network Basic / Safely managed service levels	Age Management model
Assets	Pumps, Pipes, Tanks, Sensors/ Meters, Tap stands	Type, age & status Unit cost & expected life (average duration before replacement)
Operational requirements	Energy Chemicals Operation staff	Average need per m ³ water produced Staff required, salary + transport + other costs
Support functions	Technical support Monitoring	Staff required, salary + transport + other costs. Frequency
Sanitation		
Approaches used	Sanitation marketing, Community promotion, FSM	

¹ **Asset Inventory/ Registry: maps**, categorises and classifies all existing WASH assets (e.g. water source, pumps, latrines etc) based on their age, current status, level of service provided to inform needs for eventual repairs and/or replacements of certain components,

Assets	HH, HCFs, Schools etc Latrines FSM collection and treatment	Type, age & status Subsidies level
Promotion	Promotion packages Trainings Dissemination	Staff required, salary + transport + other costs. Frequency
Marketing	Creation of enterprise associations	Staff required, salary + transport + other costs. Frequency
Support functions	Monitoring Technical support	Staff required, salary + transport + other costs. Frequency
Hygiene		
Assets	HH, HCFs, Schools etc HWFs	Type, age & status
Promotion	Creative design Promotion packages Trainings Dissemination	Staff required, salary + transport + other costs. Frequency
Support functions	Monitoring, Supervision Technical support	Staff required, salary + transport + other costs. Frequency

See References for more information.

Who should be involved in performing LCC?

Performing an LCC assessment should be a participatory process, involving at least:

- **Service providers** (including utilities, private operators etc): information about LCC is key for operation, minor and major maintenance planning, budgeting and tariffs setting. Service providers should also have most up to date information about unit costs, assets status, tariffs recovered.
- **Service authorities:** local government staff responsible for water, sanitation and hygiene teams (so possibly including staff under Ministry of Water and of Health) and local finance team (e.g. responsible for local government planning and budgeting processes) should be involved throughout LCC process to support with analysis, data sharing and decision making on future scenarios planning and funding reviews.
- **Community representation:** team of community representatives to support decisions about the most affordable and suitable service types, budget tracking processes by communities can support in increasing awareness of responsibilities to cover costs, track all costs concerned and the funding sources and develop possible subsidies plans for poorer communities' groups

Other possible actors to be involved include: local NGOs working on WASH and all private WASH sectors service providers active in the area.

What are the outcomes of a Life cycle costing?

- Year by year breakdown of all predicted and planned costs to ensure long term services and behaviours. Different scenarios can be modelled to inform planning and decision making.
- Predicted costs peak in certain years due to large replacements (CapManEx) or software interventions (see year 2028 in figure 3 below) This is particularly useful to inform funding flow changes needed or to review implementation strategies to distribute these costs across years with preventative maintenance for example.

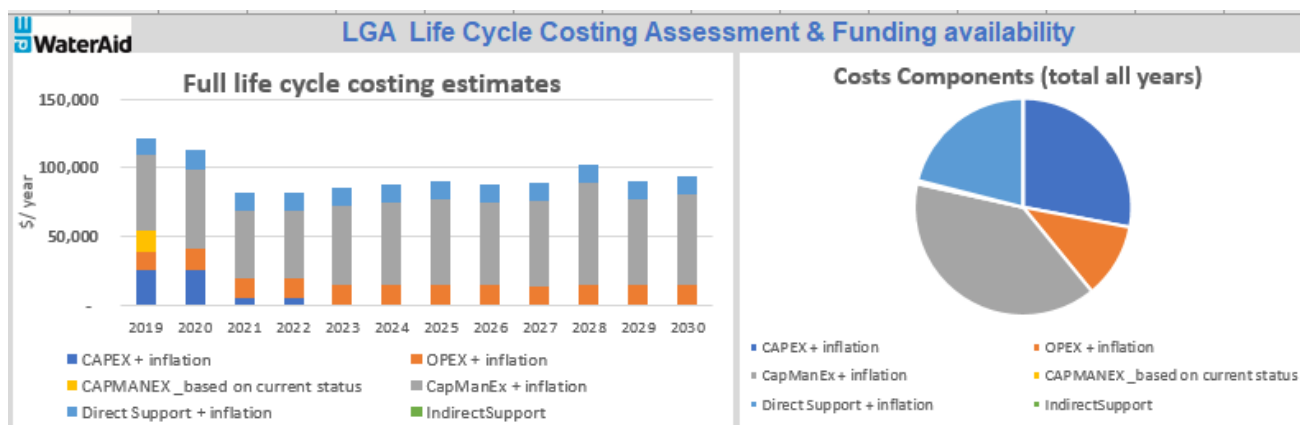


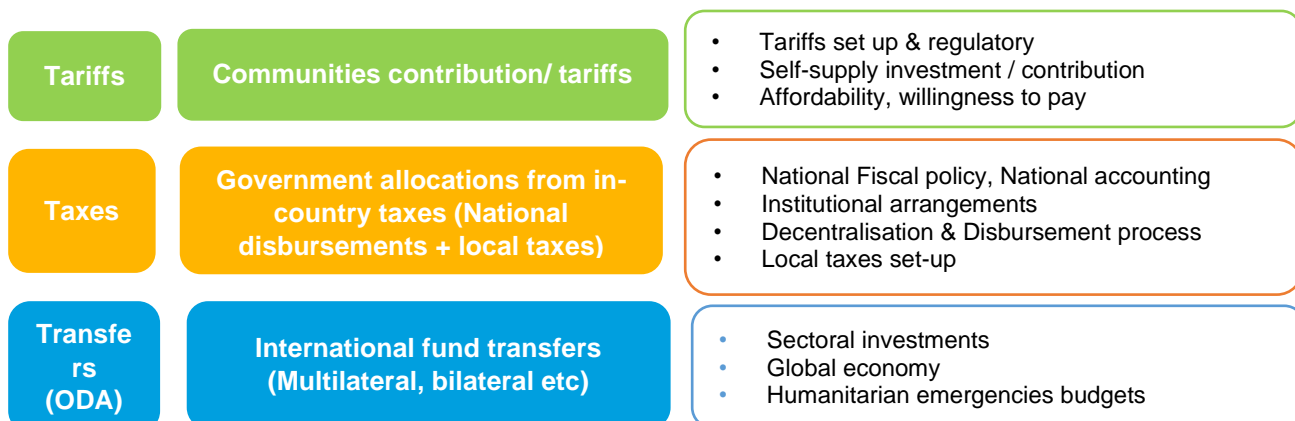
Figure 3. Example of output from a 11 years LCC prediction costs for sustainable water supply services (Nigeria, Kirfi district)

How to use Life Cycle costing outcomes?

- Data from LCC **informs strategic short- and long-term planning and budgeting** (e.g. district investment plans, multi-year budgets)
- Detailed costed plans can be used to **highlight ALL the costs necessary** for sustaining services, including the ones that are often forgotten
- Evidence from the fully costed plan compared to current funding available helps to demonstrate **funding gaps** and be used for budget advocacy and **coordination** across different actors financing WASH sector
- By understanding the different long-term cost impact, **selection of approaches, technologies and management models can be informed** to ensure they are financially sustainable whilst remaining affordable for users.
- LCC data allows service providers, community management structures and local authorities to shift their focus **from reactive to proactive management** of assets and services

After Costing, what financing analysis should be included?

- **Map the current funding sources and flows (Figure 4)** that could cover the different costs identified. These are usually classified with the 3Ts: tariffs



(contributions from users/consumers), taxes and transfers. A number of factors impact the actual availability of funding to deliver and sustain services and should be reviewed (e.g. tariff setting, public finance disbursement processes etc). Understanding these factors and supporting addressing some of the existing blockages (e.g. disbursement processes, tax collection etc) can support addressing some of the finance gaps.

- Map specific funding sources to each life cycle cost component:** this is dependent on management models set up and institutional arrangements (for example, with a fully privatised utility most costs would have to be covered by tariffs if no government subsidies are present). A key consideration is the responsibility for payments of CapManEx and Direct Support costs as these are the components often forgotten and that hinder sustainability of WASH services and behaviours.

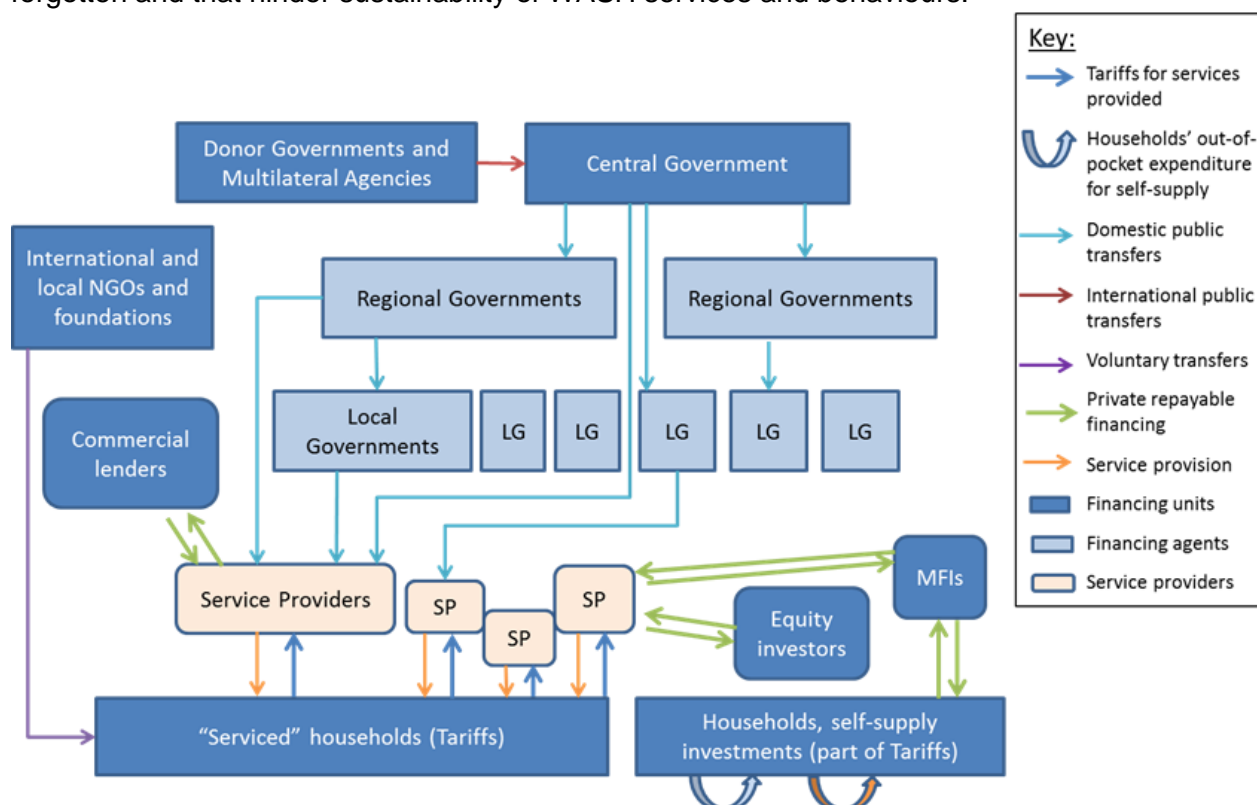


Figure 4. Finance flow analysis (from Tremolet, 2016)

- Compare WASH budgets and expenditures** for the last 3 years within the area / local government to analyse trends, discuss differences between budgets and expenditure (e.g. to identify blockages that hinder fund disbursement to local levels and absorption of existing funding available particularly from National Taxes flow).
- Perform services **Affordability studies** to analyse capacity of all community members to pay for services or to identify needs for subsidisation.
- Identify **new funding sources and/or identify how existing funding sources / flows** could be improved, for example:
 - Advocating for additional funding dedicated to WASH (using the costed plan as evidence)
 - Tariffs review

- Increase cross-sectoral subsidisation in tax (e.g. taxes from specific goods for sanitation etc)
- Identify requirements to attract increase private financing for WASH (with blended -finance models)

LCC Resources

- 2010. Fonseca, C et al. Life-Cycle Costs Approach: glossary and cost components. *Briefing Note 1*. IRC-WASH
- 2012 Costing Sustainable services.
https://www.ircwash.org/sites/default/files/module_1_2.pdf
- 2017. Tillett, W. et al. A District Level Roadmap for Universal Access to Sustainable WASH Services. Agenda for Change.
- <https://www.youtube.com/watch?v=Gkzf0zBgPHM>

WASH financing resources

- SWA – Handbook for Finance Ministries – how to make public investment work
<https://www.sanitationandwaterforall.org/handbook-finance-ministers-how-make-public-investment-work>
- Mobilising finance for WASH : getting the foundations right
https://www.ircwash.org/sites/default/files/mobilising_finance_for_wash_-_web.pdf
- Financing WASH: how to increase funds for the sector while reducing inequities
https://water.org/documents/48/Water.org_Financing_SDG_Position_Paper_April_2017.pdf
- WaterAid Pakistan - Financing water supply, sanitation and hygiene for a clean, green and healthy Pakistan
<https://washmatters.wateraid.org/publications/equal-to-the-task-financing-water-supply-sanitation-hygiene-clean-green-healthy-pakistan>
- WaterAid Nigeria Equal to the task: financing for a state of emergency in Nigeria's WASH sector
<https://washmatters.wateraid.org/publications/equal-to-the-task-financing-state-of-emergency-nigerias-wash-sector>