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IMPROVING ACCESS AND SUSTAINABILITY**

**Adapting the life-cycle costs approach for rural water  
supply in DRC through the DRC WASH Consortium**

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**BRIEFING PAPER**

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*Investments in rural water infrastructure in DRC are generally made without good information on what financing and technical support is required in the long term for the infrastructure to provide a sustainable service to the users. Given the under-developed policies and local government structures for water supply, the responsibility for organising and financing long-term operation, maintenance, and minor and major repairs is left to the users by default, usually through community-based water management committees. The DRC WASH Consortium is trying to address this issue by adapting the life-cycle costs approach (LCCA) to permit informed investment decisions by local actors which are based on an analysis of long-term economic, technical/environmental and social/institutional feasibility. This paper explains how the Consortium has developed this approach so far, the lessons learned, and recommendations for other WASH sector actors implementing the life-cycle costs approach.*

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**Introduction and context**

In the Democratic Republic of the Congo (DRC), the national rural WASH programme is called “Healthy Villages and Schools” (*Village et École Assaini*, VEA). The programme is run through the hygiene division of the Ministry of Health with support from UNICEF as the key implementing partner and sub-contractors at local levels for community mobilization and infrastructure construction. The programme completed its first phase of implementation from 2008-2012. Approximately 2,500 villages completed an eight-step community process based on PHAST, achieving the seven WASH “national norms”<sup>1</sup> which are required to be certified as a “Healthy Village” (DFID, 2013). A second phase of the national programme runs from 2013-2019, which includes post-certification support to previous villages and expanding the programme to new villages, targeting over 3 million beneficiaries.

However, the sustainability of rural WASH services initiated by the national programme remains a huge challenge (Black, 2013). The sustainability study of the national programme in villages 1 to 4 years after their certification showed that only 2% of villages had maintained the seven norms (Hydroconseil, 2014). Although 84% of the population had access to an improved water source, there were key concerns about sustainability. While spring protections represented the most common infrastructure, 33% of boreholes with handpumps were not functioning properly, and only 22% of villages had any form of collection of funds to cover the operation and maintenance of water points

**The DRC WASH Consortium and its approach**

In this context, the DRC WASH Consortium was established in 2013 as a complementary initiative to the national programme. The Consortium has the same aim of supporting communities to become “Healthy Villages” according to the seven national norms, but develops and tests alternative implementation approaches with the objective of improving sustainability in the long term. The DRC WASH Consortium comprises five international NGOs: Concern Worldwide (the lead agency); Action Against Hunger (ACF); ACTED; Catholic Relief Services (CRS); and Solidarités International (SI). The Consortium’s current programme is funded from 2013-2017 by UKAid (also one of the key donors of the national programme). The Consortium works in partnership with local health services, aiming to support 461 villages and 554,122

beneficiaries in 15 health zones in rural DRC. Therefore, while much smaller than the national programme, the Consortium covers a sufficient scale and range of contexts to produce relevant lessons for the sector. The programme proceeds in a sequence of different phases of villages and conducts additional research and innovation projects to enable learning from earlier phases to be continuously shared and fed back into the programme’s later phases and the wider sector.

The Consortium’s programme approach involves a 12-step process which lasts eighteen months in each village, followed by additional monitoring and evaluation for a further six months (at this moment, the village should become part of the national programme’s post-certification monitoring process). There are three key differences in methodology compared to the national “Healthy Villages” programme. The first is a focus on the promotion of community-led “Small Doable Actions” before considering a potential external investment in water infrastructure. This approach aims to maximise the WASH benefits from actions and behaviour change which are possible with the community’s own resources, to mitigate the potential risks of sustainability of infrastructures developed with external funding. The second difference is adapting behaviour change approaches to each context through a mix of PHAST, CLTS and sanitation marketing (instead of using an approach based on PHAST and subsidizing latrine slabs). The third difference is emphasizing the use of the life-cycle cost approach to inform decision-making.

### The life-cycle costs approach

The WASH Consortium has adapted the definitions of the different cost components of water services proposed by the WASHCost project, summarized in Fonseca et al. (2011) and shown in Table 1. The adaptation of the life-cycle costs approach focuses on the recurrent costs which occur at service provider (community) level: operating and minor maintenance expenditure and capital maintenance expenditure. As shown in Table 1, some costs of direct support are considered. However, costs which occur at national levels, namely indirect support costs such as government ministries with responsibility for water, or the cost of capital, are not included.

<b>Table 1. Type of recurrent costs of water services at local levels according to the life-cycle costs approach (adapted from Fonseca et al. 2011)</b>		
<b>Life-cycle costs terminology</b>	<b>Life-cycle costs description</b>	<b>Adaptation into the approach of the DRC WASH Consortium</b>
Operating and minor maintenance expenditure (OpEx)	Expenditure on labour and materials needed for routine maintenance which is needed to keep systems running, but does not include major repairs.	“Level 1 costs”: Regular costs which are needed at least annually, with a particular emphasis on the management costs required at community level (e.g. costs of fee collection and social marketing), not just hardware costs such as spare parts.
Capital maintenance expenditure (CapManEx)	Renewal, replacement, and rehabilitation costs which go beyond routine maintenance.	“Level 2 costs”: Costs of major repairs which are required typically every 2-5 years.
		“Level 3 costs”: Costs of rehabilitation which is required typically after 10-15 years.
Expenditure on direct support (ExpDS)	Costs of ongoing support to users and local stakeholders, for example on local government or district support staff.	For areas where this direct support is in theory provided by local health services, the costs are not included in the estimates for what communities need to pay. One NGO of the Consortium is testing ideas of direct support from the private sector; this expenditure on direct support is included in “level 1 costs” paid by the community.

### The process of adapting the life-cycle costs approach into the Consortium

The timeline of how the Consortium adapted the life-cycle costs approach and integrated this into its programme approach is shown in Table 2. The key mechanism for monitoring and improving the programme is the joint “Technical Working Group” of the Consortium members. This group is led by a representative of the lead agency and meets every 3 months to review progress and determine any changes that need to be made. Every 6 months, the Consortium also organizes an external “Technical Review” workshop with representatives of all key stakeholders in the sector to share experiences and provoke sector

debate. As shown in the table, these internal and external processes have been essential to developing the approach and ensuring an iterative process between experiences from the field and the development of new methods and tools. At the time of writing in February 2015, the villages in the Consortium's first phase of intervention were reaching the end of the 18-month implementation phase and were getting ready to be certified according to the national norms. At the same time, the Consortium was reviewing the tools it had developed for implementing the life-cycle costs approach in order to improve them for the subsequent phases of villages.

<b>Table 2. Timeline of key project activities and programme development</b>		
<b>Timeline and date</b>	<b>Key milestones: development of life-cycle costs analysis in the programme approach</b>	<b>Key milestones: implementation of the first phase of intervention</b>
Months 1-3: July- Sept 2013	Review of original programme proposal to highlight use of life-cycle costs approach and identify key tools required for implementation.	Official start of programme and start of project activities in the field: coordination and planning with local authorities.
Months 4-6: Oct-Dec 2013	First drafts by NGOs of 'business plan' tools for water points to analyse estimated life-cycle costs and enable decision-making on investments.	Selection of 174 villages for first phase of intervention (approx. 180,000 people) and baseline survey (3955 households).
Months 7-9: Jan-Mar 2014	Workshops on life-cycle costs held internally and externally with over 50 participants from the sector with support of IRC WASH.	Start of community mobilisation, including 'self-evaluation' by communities, and initial technical feasibility assessments.
Months 10-12: Apr-June 2014	Development of a harmonised 'business plan' tool for the 5 NGOs to facilitate the estimation of life-cycle costs and the ability of communities to cover these costs, based on adaptation of a tool from Global Water Initiative (GWI).  Revision of Water Management Committee evaluation tool to better capture financial data through programme monitoring.  Decision to select 20% more villages than originally planned for the 'software' part of future phases to enable a genuine investment decision at the point of considering hardware installation.	Promotion of "Small Doable Actions" for water, sanitation and hygiene using local materials (no subsidy) as part of community action plans led by village committees.  Examples include the construction of hygienic latrines, handwashing stations, local improvements to existing water sources such as using bamboo as a pipe at springs (to permit the drawing of flowing water), and basic household water treatment such as boiling and solar disinfection.
Months 13-15: Jul-Sept 2014	Further adaptation and simplification of the 'business plan' tool by each NGO in the context of each area of intervention.  Collation of preliminary results of the community 'business plans' from 174 villages into the resulting investments proposed as viable for the first phase of intervention.	Second 'self-evaluations' with communities to review the progress made through Small Doable Actions.  Development of 'business plans' for potential water points in communities which had made maximised the progress possible with their own resources and Small Doable Actions.
Months 15-18: Oct-Dec 2014	External workshop with over 60 participants on the importance of considering users as 'clients' not 'beneficiaries' for community mobilization.	Joint decisions made with communities and local authorities about investments in water points for the first phase of villages.
Months 19-21: Jan-Mar 2015	Operational research on how to improve the 'business plan' into formats for use by communities and local health services, not just by NGOs.  Operational research on 'alternative solutions' (such as household water treatment) in villages where a community water point is not viable.	Installation of water points according to investment decisions.  Final 'self-evaluation' and endline survey for the first phase of intervention.  Start of community mobilisation activities for villages in the second phase of intervention.
Months 22-24: Apr-June 2015	Review of overall use of Life-Cycle Costs Approach as part of mid-term evaluation and recommendations for improvements for the remaining phases of the programme.	Monitoring use of community 'business plans' after construction as tools for financial management.

### Using the life-cycle costs approach to inform decision-making

The first objective of the WASH Consortium in adopting the life-cycle costs approach was to enable local actors (communities and local health services) to make informed decisions about whether the possible installation of an improved water point was likely to lead to sustainable services in the long term (given local capacities). The secondary objective was to permit also an informed decision between different feasible technical options, in terms of estimated costs vs level of service. Table 3 shows the guidance used in this decision-making process based on the estimated capacity of the community to cover the estimated long-term costs of the proposed water point.

<b>Estimated capacity of the community to cover long-term costs of the proposed water point</b>	<b>Recommendation for implementation (final decision made with community and local health services)</b>	<b>Action for advocacy</b>
The community will not even be able to cover operation and minor maintenance costs ("level 1 costs")	Assess the potential for alternative solutions such as household water treatment.	Advocate for consideration of alternative solutions in national policy as part of 'progressive certification' of Healthy Villages in the national rural WASH programme.
The community will be able to cover operation and minor maintenance costs ("level 1 costs"), but not major repairs ("level 2 costs").	Proceed with investment and installation of infrastructure, and support the community to set-up income-generating activities to help cover "level 2 costs" as well in the long-term.	Advocate for potential solutions to address capital maintenance costs in the medium-term (such as mutualisation of costs between multiple villages) and the long-term (eventual cross subsidies and government investment).
The community will be able to cover operation and minor maintenance and major repairs ("level 2 costs") but not full rehabilitation ("level 3 costs").	Proceed with investment and installation of infrastructure.	

### Life-cycle costs tools used and developed

The key tools developed by the Consortium were based on adaptations of tools from the Global Water Initiative (GWI) in West Africa. The first was a spreadsheet tool for analysing the estimated life-cycle costs of a proposed water point, the potential cost-benefit analysis for the community, and the ability of different possible tariffs and tariff mechanisms (such as direct sales per volume, monthly tariffs, and community income-generating activities) to cover these costs. The second tool was a facilitator's manual for how to guide a community through the process of analysing costs and different financing options, leading to the eventual choice of infrastructure and set-up of a financing mechanism (see GWI, 2012).

The key adaption made by the Consortium was to widen the scope of the tool to include factors such as more detailed analysis of user demand, and to analyse the risks over which the community would have little control (such as supply chains). In practice, this meant that additional steps were included as part of the Consortium's own programme manual, referring to the GWI tools and documents as needed. The Consortium also chose to refer to this process as developing a 'business plan' for the proposed water service improvements. The terminology 'business plan' was chosen to highlight the difference with the humanitarian approach that NGO staff in DRC are more accustomed to using.

As implementation progressed, all the members of the Consortium adapted the spreadsheet tool into a simpler version (finding the original too complicated). This helped increase ownership of the process by field teams. However, so far it was been difficult to develop formats which are suitable for the community and local health services. The Consortium is addressing this through further operational research in 2015, while continuing to monitor results from the first phase of intervention.

### Initial results

Table 4 shows a first summary of the results of analysis for villages in the Consortium's first phase of intervention.

<b>Estimated capacity of the community to cover long-term costs of the proposed water point</b>	<b>Number of villages</b>	<b>Comments</b>
The community will not even be able to cover operation and minor maintenance costs ("level 1 costs")	32 villages	In general, these villages are very small (populations of 300-500 people), poor and remote, and where the only feasible technical option would have even operation and minor maintenance costs beyond their capacity. In these communities the Consortium is assessing the potential for alternative solutions such as household water treatment.
The community will be able to cover operation and minor maintenance costs ("level 1 costs"), but not major repairs ("level 2 costs").	28 villages	In these villages, the typical problem is the costs of major repairs for handpumps. These are in remote areas where supply chains for spare parts are weak and therefore relative transport costs are high. The Consortium is investigating how to better support supply chains to reduce costs.
The community will be able to cover operation and minor maintenance and major repairs ("level 2 costs") but not full rehabilitation ("level 3 costs").	113 villages	This is the case for the majority of villages where protected springs are feasible, and some of the villages where boreholes or dug wells with handpumps are proposed. It is important to note that these are initial results, but that final review and investment decisions were in progress at the time of writing.

At sector level, the Consortium has also succeeded in opening up the debate about life-cycle costs. At its first external "Technical Review" workshop with representatives of all key stakeholders in February 2014, the Consortium invited an expert in life-cycle costs from IRC to facilitate one day of the workshop in order to promote awareness and discussion of the approach. The participants adopted the recommendation that sector actors should better collect, analyse and share data on life-cycle costs (even if this data is limited so far in DRC). The sector should also discuss the issue of life-cycle costs in relation to the ongoing processes of decentralisation in DRC. This initial debate was followed up during the second external "Technical Review" workshop in December 2014 which included presentations from other stakeholders such as the Water and Sanitation Programme of the World Bank and the National Committee for Action on Drinking Water and Sanitation on the importance of using life-cycle costs analysis along with an approach to consider users as 'clients' (not 'beneficiaries') in order to better understand their demands.

### **Lessons learned and recommendations**

The following are the key lessons learned so far, and recommendations for other actors:

- The development of the life-cycle costs approach within the Consortium so far has required continual adaptation. Although this is in line with the Consortium's original logic, as well as the move to "adaptive programming" by the donor DFID, this has required time for reflection both internally and externally and means that the implementation of project activities has taken longer than anticipated. This has required transparent engagement with the donor and government partners to ensure that the longer-term benefits of this time taken are understood and agreed by all.
- It is important to find a balance between harmonising the approach and tools across the different members of the Consortium and permitting some freedom to adapt for each member. As discussed above, this promotes a sense of ownership of the teams who are using the tools, and also permits adjustments according to different contexts within DRC and to encourage new ideas to emerge from project activities.
- At this stage of implementing a life-cycle costs approach, the key concepts and the fact of using the approach to inform decisions are more important than the exact details of the analysis and calculations made (especially because the accuracy of any calculation is limited by the poor detail that exists in DRC). This is an important lesson for other actors in making sure that the use of life-cycle costs is targeted to inform a specific decision or activity, such as the process of investment decisions for the Consortium.

### **Emerging issues and recommendations**

The implementation of a life-cycle costs approach so far has mostly focused on the recurrent costs which occur at community level of operating and minor maintenance expenditure and capital maintenance

expenditure. Although some costs of direct support are considered, this should be further analysed in collaboration with the national programme and UNICEF who have a greater emphasis on developing local health services to help provide this support in the long-term.

For the Consortium itself, the greater focus on longer-term sustainability has led to a partial shift away from working in the most vulnerable regions and communities and towards more feasible intervention areas. However, it is still important to consider what alternative approaches to community-based water supply could be feasible in such areas (such as self-supply or household water treatment). The Consortium will be developing further operational research on this theme in 2015.

Finally, the question remains of to what extent it is possible to consider a life-cycle costs approach and long-term sustainability in post-conflict situations or fragile states, especially those such as DRC where water sector policies and government structures are so under-developed. For example, Lockwood and Smits (2011), in their review of how rural water supply can move towards a sustainable service delivery approach, deliberately exclude fragile states from the analysis because they have such specific additional challenges. However, given the weak local capacity in DRC, it seems important to at least use life-cycle costs analysis to support more realistic investment decisions now and prepare for better sector planning in the future. The next step will be to use life-cycle costs as part of ongoing performance monitoring and supporting decisions after the initial investment stage.

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### Notes

<sup>1</sup> The seven national norms are: the village has an active committee for water, sanitation and hygiene; at least 80% of the population has access to clean water; at least 80% of households use hygienic latrines; at least 80% of households dispose of their waste hygienically; at least 60% of the population washes their hands before meals and after latrine use; at least 70% of the population understands the fecal-oral route of disease and ways of preventing transmission; and the village is cleaned at least once per month.

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