



The Spindle

connecting innovators for development

Efficiency analysis in water supply projects

SDG 6 calls for universal and equitable access to safe and affordable drinking water for all by 2030. Most projects in the area of water supply have a strong market-oriented approach which is usually based on three assumptions:

- On the demand side, people's attitudes need to be changed towards developing a willingness to pay for water supply services.
- On the supply side, a well-functioning private sector-based supply chain for water is a prerequisite for an effective and sustainable coverage
- An enabling environment providing regulation and funding is needed to support these changes.

This case explains how to analyse efficiency in water supply projects.

The Partos Efficiency Lab, November 2017

This case is one of a series of ten that was produced in the framework of the Partos Efficiency Lab. See back cover for more information.

Project at-a-glance

- Project type: Water supply project
- Geographic intervention area: Region in a country South Asia
- Project budget: EUR 900,000
- Budgeted for end-of-project evaluation: EUR 16,000
- Project Duration: 3 years

Project objective

In the project area 15% of the people do not have access to safe water. This situation affects the quality of life of the people concerned and is one of the causes of the high mortality rate among under-fives.

Therefore, the objective of this project is to achieve that 140.000 people in the project area (approximately 30.000 households) who currently do not have adequate access to safe, will have acquired:

- adequate and sustainable access to improved WASH facilities, products and services; and
- the knowledge, skills and behaviours to use these in an appropriate manner.

Project approach

This impact will be achieved through three outcomes:

The target group make adequate use of water supply services

People in the targeted communities use the water supply services in a responsible way and are willing to pay for the services.

Suppliers of water (communal and private) improve their services

In many parts of the project area communal water committees have basic capacity to operate the water supply systems and to raise funds from the community for repairs and maintenance. The project will link the 40 water committees up with 32 entrepreneurs who are specialised in major maintenance and repair services.

In 20 other communities the communal water committees are not capable of mobilising community support for the repair and maintenance of water supply systems. Consequently, they have failed to deliver good quality water in a sustainable way. In these communities the project will support private sector actors who want to invest in water supply on their own or in partnership with government or community-based institutions.

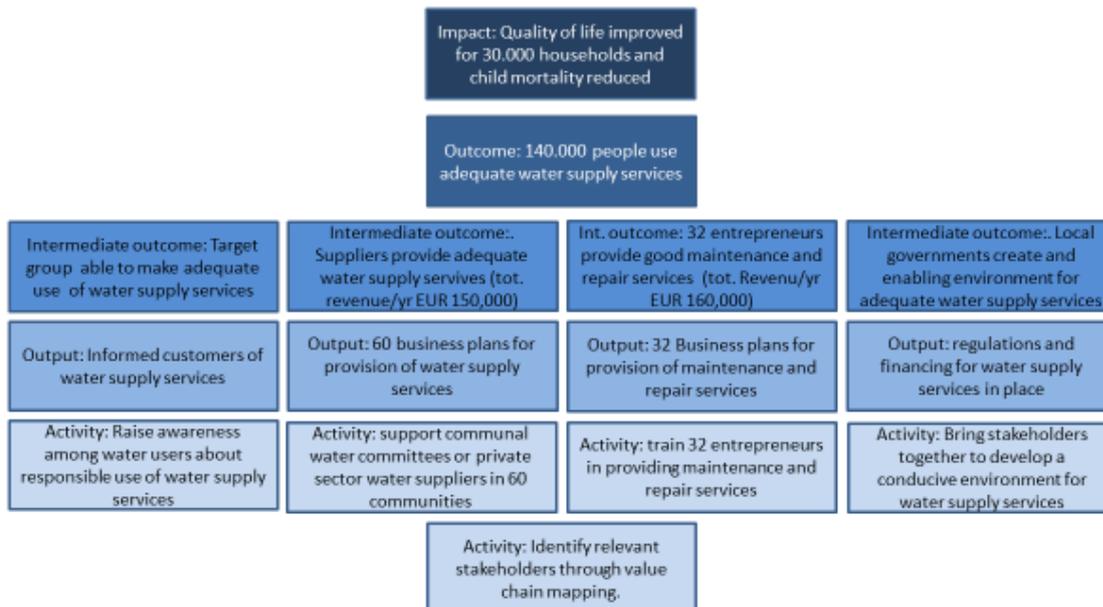
The project will support communal water committees (in 40 communities) and private sector providers (in 20 communities) of water supply services in 60 communities. The support consists of helping them to develop their technical, entrepreneurial and financial capacities for delivering high quality water supply services on terms that are affordable for the target group. At the same time, the project will help them raising awareness among water users that water supply is a service that cannot be provided free of charge and about the importance of making responsible use of water.

Improved performance of actors that constitute the enabling environment

One of the main actors responsible for creating an enabling environment are the local governments. The performance of local governments will be strengthened in the following areas:

- Bringing stakeholders together to develop and implement local water supply development policies
- Developing and implementing regulations concerning water supply
- Investing in and maintaining major infrastructural works for water supply.

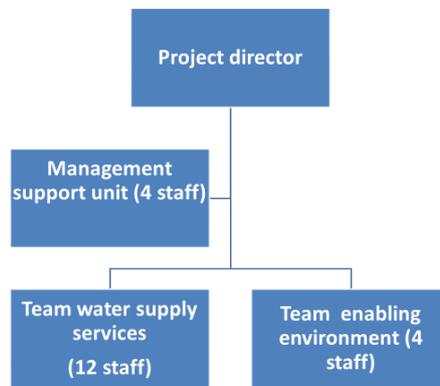
Theory of Change



Project organisation

The project management is composed of a director, a management support unit and four thematic units. One thematic unit for each outcome.

The project has 21 staff. 16 are involved in project work. 5 staff including the director in project management and administration. Each staff member is provided with office space, a computer and a mobile phone. The project has one car and 8 motor bikes.



Recommended approaches for assessing efficiency

Notes on applicable tools and methods, Pol de Greve

Remarks on the case

The water supply case description provides limited information on the budget breakdown by costs and cost centres. The 4 core components of the project are:

- community based interventions
- supporting communal water committees
- supporting private sector agents
- policy influencing.

The ToC has little or no details on pathways of change i.e. the sequence outcomes that must occur in order to reach your long-term goals. See annex for an example of a more detailed ToC that shows such pathways. A similar detailed ToC would be necessary in this case to be able to set clear boundaries for the efficiency assessment and identify adequate measurements of efficiency.

Level 2 tools and methods

Level 2 tools and methods compare the efficiency of entire aid interventions with alternatives or benchmarks with the purpose of selecting those interventions producing the largest net benefit with available resources.

All methods in this group can also be conducted ex-post for accountability and learning purposes, i.e. to verify or correct ex-ante results and to improve assumptions for subsequent ex-ante application.

Level 2 methods and tools that are applicable to this project include:

- Cost-Effectiveness Analysis – Cost-Utility Analysis
- Cost-Benefit Analysis
- Social Return on Investment
- Multi-Criteria Decision-Analysis (MCDA)

Preliminary observation: the physical water supply elements, including infrastructure, have an integrated (value-chain like) setting whereby different actors and interventions are linked with the ultimate aim to realise a concrete outcome being 140.00 people being connected to and using water supply services. The programme activities that relate to policy influencing / enabling environment, on the other hand, are characterised by quite different dynamics, processes, targets and outcomes, the latter being rather intangible (policies and regulations). Combining the two components in a single assessment will be extremely challenging, whatever approach one may choose. The cost related to policy influencing will be included in the efficiency assessment¹, thereby assuming that the outcomes of policy work will contribute to (and be reflected) at impact level (improved livelihood and reduced child mortality).

¹ Even though, attributing (segregating) costs for policy influencing (including weighted allocation of overheads) in a specific cost centre can be informative and may allow for some general considerations notably regarding economics and (input-output) efficiency of these interventions

Cost-Effectiveness Analysis / Cost-Utility Analysis

Note – it is (for some arguably) assumed that Cost-Effectiveness Analysis is the general term for an economic analysis that compares the relative costs and outcomes of different courses of action and that Cost-Utility Analysis can be classified as a form of CEA (often applied in health economics). CEA thus compares different kinds of interventions with similar, but not identical, effects on the basis of the cost per unit achieved. Typically, the CEA is expressed in terms of a ratio where the denominator is the non-monetary unit of benefit created and the numerator is the cost associated with producing this benefit.

The ToC indicates two key impact areas:

- Livelihood improvement presumably pertaining to the entire target population of the programme,
- Child mortality.

There is no obvious or logic method for blending outcomes in these two areas into a single impact measurement that would be required for a CEA at programme level.

Improved livelihood is a complex multi-faceted concept that does not lend itself easily to assessment of effectiveness if one aims to capture benefits beyond those related to income generation and household-expenditure. Other methods (like SROI) provide better options in this respect.

CEA (CUA) is commonly applied for health programmes whereby morbidity and mortality can indeed be singled out as key outcome of a programme. There are different options in terms of unit measurement of outcomes such as QALY or morbidity / mortality rates (assessing effectiveness in terms of cost per % reduction in m&m rates).

Nonetheless, in the case of water supply programmes, it seems impossible to treat the stated impact areas as unit cost centres in such a way that programme disbursements (or budget) can be apportioned to each one separately (direct costs plus allocated portion of programme overhead). Therefore, there is a limited potential of using CEA in this case, unless one would accept the (ToC's sub-impact outcome) "access for one individual community member to adequate water supply service" as the overall key performance indicator of the programme. Admittedly, this would drastically (and inaccurately) limit the assumed scope of impact of the programme.

Financial and Economic Cost-Benefit Analysis

There is some potential for using CBA even though monetary benefits might be but a fraction of the overall impact – see example of ToC in annex. Nevertheless, one may indeed be able to capture some programme benefits in monetary terms, either directly if related to income generation (e.g. suppliers' profit margin) or reduction in household expenditure (e.g. for health care), or indirectly (e.g. opportunity cost of time savings for water collection). Incidentally, the same applies to incremental costs, not only programme-related costs but also costs incurred at household level e.g. increased direct expenditure for purchase of water.

There are documented cases whereby effectiveness of a water supply programme could be established merely on the basis of a CBA of incremental monetary costs and benefits.

Note that for reliable measurement of efficiency, incremental benefits need to be established, which in an ex-post assessment requires reliable baseline data and/or control group. In the ex-ante situation, programme managers (and funders) must ensure that provision is made in the project formulation, planning, and budget for carrying-out an adequate baseline as well as an ex-post CBA (or other way of efficiency assessment).

Capturing Blended Values – Social Return on Investment

Development programmes create blended values, i.e. the changes that they generate, can take many forms e.g. financial, economic, social, environmental, political, cultural, etc. WASH projects are no different, on the contrary they typically create a myriad of tangible as well as intangible values (see the example of a detailed ToC in annex) that may encompass a multitude of impact areas, e.g. in health, education, inclusiveness, participation, empowerment, personal security, income, livelihood, social capital, and many more.

Some methods such as Social Return on Investment (SROI) allow to capture blended value creation for multiple stakeholders. SROI accounts for stakeholders' views of impact and puts financial 'proxy' values on those impacts which do not typically have market values. The result is a single cost-benefit ratio and measurement of effectiveness that is based on / includes the financial and non-financial (social, environmental) costs and values generated by the programme. Technically speaking, SROI calculation is similar to CBA and NPV, i.e. based on discounted costs and benefits².

By way of example: in documented SROI assessments of water supply programmes, non-monetary outcomes were captured and monetised

- Livelihood in terms of changes in income or asset base at household level, or as a way to educational and health development (see below) of individual and household members.
- health in terms of reduced health care expenses, income from working days not lost due to illness, enjoyment of good health;
- education as future improved income, social status, enjoyment of having access to (higher) education;
- (women) empowerment can be captured (proxy) as a way to educational, economical and health development (see above points)

Areas such as empowerment (as an end in itself) or personal security are more challenging and may be difficult to monetise (at individual level³). Therefore, in SROI the numeric assessment (ratio calculation) needs to be completed with a narrative section that provides details on principles used for monetisation of intangibles and to list and describe values that could not be monetised (but are generated by the programme).

Multiple-Criteria Decision-Analysis (MCDA)

A MCDA scoring model calculates total scores for different intervention alternatives based on a set of weighted criteria. MCDA facilitates decision-making in the face of incomplete data and uncertainty. As such, they can be used to complement (rather than replace) other methods.

In the present case, some comparative criteria could include

- Inclusiveness (for marginalised, women, children & youth, elderly)
- Expected economic impact on different actors (private sector service suppliers, water users)
- Expected welfare impact for households
- Expected economic lifetime of infrastructure and M&O costs
- Expected sustainability of outcomes

² Taking into consideration: deadweight and attribution

³ At state level empowerment may be reflected in government budget shifts aimed at strengthening social and economic position of women and realising their rights

- Embedment in community and representativeness of governance set-up
- Assumed effect of lobby and advocacy efforts

The criteria should be developed in a participatory process that involves decision makers and other stakeholders. The main advantage of this approach is that the decision-making process is transparent to the decision-maker and to stakeholders. It is also systematic in the sense that criteria, weights and scores can be critiqued separately, leading to more informed decisions.

Applicable level 1 tools and methods

Level 1 tools and methods identify efficiency improvement potential in a single intervention. In contrast to level 2 analysis, the principal purpose of level 1 analysis is to improve the efficiency of the intervention at hand (rather than choosing the most efficient interventions from a pool of options).

Level 1 methods and tools that are applicable to this project include:

- Unit costs and other partial efficiency indicators
- Follow the money
- Financial analysis
- Comparative ratings by stakeholders

Benchmarking of unit costs and other partial efficiency indicators

Unit costs and partial efficiency indicators can also be compared across projects, but care must be taken to allow for meaningful benchmarking, i.e. that they are calculated with the same protocol and applied to similar projects under similar conditions. There are many options for unit costing (many sources of inspiration to be found online), to list but a few

- Input costs per water point, borehole, ...
- Unit cost per water point established (differentiate between investment cost and running cost)
- Unit cost per person who has got access to water (and using it)

Or in benchmarking

- % of water planned points operational,
- % water yield of acceptable standards realised
- % of intended beneficiaries actually using water point at end of programme.

Follow the money

A simple approach with high potential for identifying cost saving potentials in the project at hand is the "follow the money" approach. In this approach, the evaluator systematically disaggregates total project expenditures and, for each (important) budget item, conducts additional analysis to determine the appropriateness of procurement procedure and whether there is cost-saving or outcome generation potential (e.g. water yield, # potential). This very much covers the (respectively) "economics" and "efficiency" aspects within the 4W Value for Money concept.

A related approach is the Basic Efficiency Resource Approach that compares the input-outcome performance of operational units within one specific setting (i.e. programme or organisation). It is largely a qualitative comparison that establishes differences between units in maximising outcomes with minimal inputs

Inputs	High	Below Average efficiency	Average efficiency	BER approach
	Low	Average efficiency	Above Average efficiency	
		Low	High	
		Outcome		

Source - Oxfam

Financial analysis

Programme Level

One approach to financial analysis at programme level calculates the discounted net present value (NPV) from a financial perspective. Net Present Value is a way to value an investment taking into account the time factor of money. Conceptually and technically this is similar to the CBA method of level 2 but in a "stand-alone" mode. A related measurement, is the Internal Rate of Return (IRR). IRR is the discount rate that makes the net present value of a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project. IRR is also an appropriate method for comparative (level 2) assessment.

Entrepreneurial level

In this case, a number of stakeholders (or groups of stakeholders) are acting as economic agents in a value-chain-like setting, i.e. the water committees, the private sector water providers and the entrepreneurs carrying out maintenance and repairs. The efficiency of such entrepreneurs can be measured and monitored using standard financial parameters and ratio's - the assumption being that economic agents will apply (at least basic) practices of bookkeeping and financial reporting (ledger, profit-loss account, cash flow).

Comparative ratings by stakeholders

A participatory method that can be useful in the present case is to ask or systematically survey stakeholders for their opinions and preferences regarding available project design choices. Questions can directly aim at partial efficiency or, if cost considerations are difficult to assess by stakeholders, at effectiveness (which the evaluator can then complement with information on costs).

For example, we can ask intended water user about their perception of user-friendliness of different supply systems, ask water committees about their capacity needs and different ways to build capacity (training, coaching, peer-to-peer), or ask women about their present constraints and challenges in access to water and to what extent different supply models may address these challenges.

Comparative ratings may not immediately serve the purpose of assessing efficiency and effectiveness but can be used to complement such assessment and is particularly relevant in an ex-ante programme formulation stage (to inform programme design).

Conclusions

Applicability of methods:

Level 2: CBA or SROI to capture blended value creation

MCDA e.g. for social rating of different models

Level 1: Financial analysis for entrepreneurial aspects & unit costing for programme

Add comparative rating for finetuning model design

