

# Functionality:

## The challenge to sustain rural water supply services

SNV Practice Brief

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### Safe water: A joint responsibility

Although impressive gains have been reported in rural water 'coverage' in recent years, the real picture in terms of the number of functioning water points is less glowing. Millions of people reported as having access to safe water do not in fact receive even basic levels of service because their water point or system is not functioning. Broken hand pumps and dry taps are a common sight in rural areas. Without clean water, people are exposed to diseases and have fewer opportunities for economic development.

With as many as one third of all water supply facilities in Africa non-functional, keeping water supply facilities operational is a challenge. This Practice Brief brings together the experiences of SNV across nine African countries working with rural communities, government agencies and the private sector to improve rural water supplies.

SNV starts by understanding the reality on-the-ground. Our work shows that behind the technical reasons for low functionality there are more complex governance issues to do with ownership and accountability. SNV and its partners design and implement actions to improve the management of rural water supplies and water supply service levels.

Experience has shown that leaving rural water points to be managed by communities on their own is a major factor in low functionality. There is a need for post-construction support with complementary roles for communities, the private sector and all levels of government to improve the functionality of rural water supplies together.



Pump mechanic in action, Zambia

**South Sudan** is emerging from 20 years of conflict, which have left it with weak institutions. In 2007, the local authority in the remote region of Eastern Equatorial State was operating from under a tree. The post-emergency period has been marked by uncoordinated and overlapping Water, Sanitation and Hygiene (WASH) interventions. In 2011 a national WASH Steering Committee was established and resources pooled from different agencies to implement a shared plan. SNV convened meetings to develop a joint strategy and systematic approach to water supply management. As a result cooperation has been improved, with one example of this being development of an SNV-led joint functionality pilot involving two international and two local NGOs.

In six sub-districts (woredas) in South West **Ethiopia**, SNV is using a preventive operation and maintenance (POM) approach to improve water scheme functionality. Options for improving the water supply are discussed within a multi-stakeholder forum - water users, operators, regulators etc - to select the most appropriate technology and develop POM guidelines for these technologies. Elements of the intervention include, training of trainers (ToT) for key government staff and local capacity builders, and the implementation of the POM approach across 10% of the water schemes. This fundamental shift from curative to preventive interventions has reduced 'downtime' in service provision. Limiting the technology choices simplifies operation and maintenance training and the management of spare parts. The POM approach is now being replicated in other woredas and districts by both the government and NGOs.

## About this brief

This Practice Brief is the fifth in a series of practice briefs and brings together experiences from SNV's work in nine African countries supporting rural communities to improve their water supplies. The Brief was developed during a 'writeshop' in Addis Ababa in March 2013 attended by the case study writers, mainly from East and Southern Africa, and facilitated by a core team also with members from Asia and West and Central Africa.

Case studies are available for download at [www.snvworld.org](http://www.snvworld.org)

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Overcrowding in South Sudan

# Introduction

SNV has been working to improve the functionality of water points and systems by addressing a combination of technical, managerial, economic and social issues. Based on its field experiences in Africa, SNV has developed an approach centred on five components (Figure 1). SNV's approach recognises that making and keeping water points and supplies functional is a collaborative effort involving all stakeholders: implementers, regulators, operators and users.

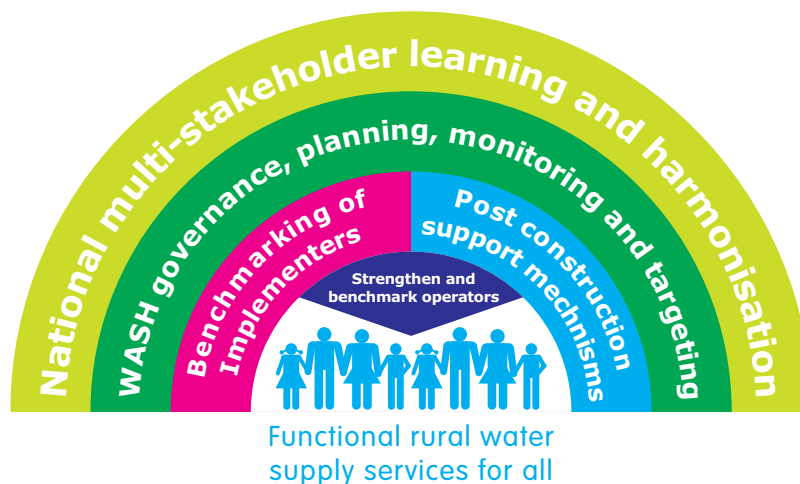


Figure 1. SNV's approach

The challenge of functionality has been around for decades and community management models developed as a response have generally been seen as an adequate solution. However, reliance on community management without adequate attention to design, construction and post-construction support has not produced the desired results.

## SNV's approach works by:

- Helping to professionalise the delivery of rural water supply through the capacity development of water supply operators and implementer;
- Benchmarking and performance monitoring of implementers and post-construction service providers;
- Supporting improved provincial/district multi-stakeholder planning, targeting and monitoring to improve investment choices and strengthen local ownership;
- Providing post-construction support through the development and implementation of institutional support mechanisms, specifying roles and responsibilities;
- Sharing lessons learned at the national level through participation in learning platforms and government-led sector development groups.

Applying this approach has enabled non-functioning water supplies in rural Africa to once again serve people with water in a relatively short time.

## Functionality indicators

### Quality

Assessed against standard drinking water quality indicators

### Quantity

Volume of drinking water used per person per day

### Accessibility

Distance or time needed to reach, queue, collect and return with water (sometimes called convenience)

### Reliability

How many days per year the supply provides water

## Measuring functionality

SNV defines functionality according to four indicators: quality, quantity, accessibility and reliability. These indicators provide a framework for measuring and monitoring functionality. They are also part of the criteria used for the Water Point Mapping exercises. Using these indicators, five service levels are defined: no service, sub-standard, basic, intermediate and high. The values for each of the indicators corresponding to a service level are specific to the country context. The 'basic level of service' reflects the national water standards. When assessing a household's water supply service level, the worst score of the four indicators defines the service level. When the Basic level of service is not met, the service is classified as non-functional. In practice proxy indicators may be used where quantitative data are not easily collected, such as for water quality.

Another important aspect of this functionality framework is its use for the so-called 'sustainability compacts'. These are standard agreements between the government, service provider and users. The relationship between the three parties is explained in Figure 2. In West Africa, SNV has been working in close collaboration with Water Aid and UNICEF to define the content of these compacts and, more importantly, how to monitor them.

Service level	Quality		Quantity litres / person / day	Accessibility	Reliability	
High	Household perception (taste, smell, appearance)	Improved	>100	<30 minutes Within household compound	12 months	
Intermediate			>50 <100		<100 metres	10-11 months
Basic			20-50		100-1,000 metres	8-9 months
Substandard		Unimproved	5-20	30-60 minutes >1 kilometre	5-7 months	
No service			<5	> 60 minutes	0-4 months	

Having standards allows future users to have an input into the initial design of a supply system, its location and the choice of technology – all of which are elements of the desired service level. SNV has incorporated steps into its sustainability approach to ensure that users' input is valued and positively contributes to the sustainability of water points and systems.

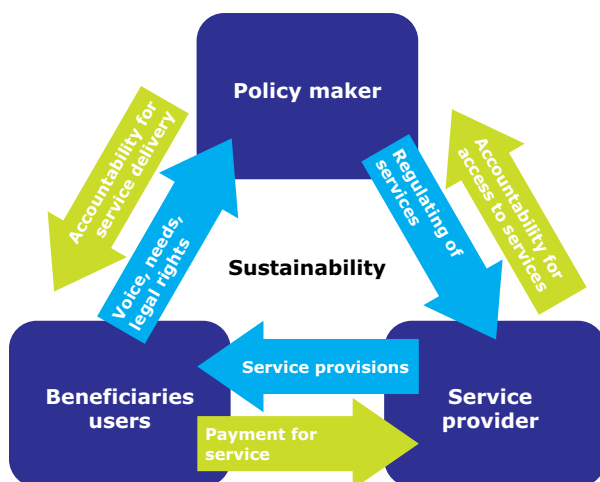


Figure 2. Source: World Bank 2004



Borehole abandoned due to dropped-in pipes, Mpika, Zambia

## Appreciating the context

A common starting point in SNV's approach is to appreciate and understand the local context. Water Point Mapping is a tool that has been applied by SNV in a number of countries. If the functionality levels found in the places where SNV and its partners have conducted water point mapping are representative, functional water supply could be as low as 50–60% in Africa. In Uganda, this would mean that 8 to 10 million people, who according to official records have access to improved services, are regularly without water.

Through Water Point Mapping, details are collected on whether or not a water supply is functioning and if it is a stand-alone facility (such as a shallow well or borehole) or a communal point as part of a larger water scheme. Mapping also gives insight into the management structure and level of service being provided. Mapping provides a better understanding of the reasons for low functionality and how to address it. Thus, mapping provides information for improved planning and decision-making. With regard to equitable resource allocation, mapping shows the geographical distribution of water facilities and highlights disparities between areas.

A number of variations on Water Point Mapping have been applied by SNV and its partners, for example, in South Sudan Water Point Mapping was part of a broader inventory of WASH. In some cases, more in-depth enquiries complement the mapping. A particular example is Kenya, where an analysis was made of two rural water schemes. The study found that, although initially it was thought that the scheme was performing poorly due to technical reasons, these technical reasons actually obscured more fundamental governance issues, primarily, the absence of support for community water committees, resulting in low levels of interest in the scheme. A similar enquiry in Zambia generated lessons on the role and performance of the private sector, both formal and informal, in improving water services.

### Analysis of two schemes in Kenya

As the first step toward establishing a sustainable management model, SNV undertook a sustainability analysis of Boka and Bubisa rural water systems in Marsabit County, Kenya. An initial enquiry and participatory exercise found the following constraints:

- Inadequate support to the local water management committees, for example, their legal status and mandate had not been explained clearly;
- Lack of participation and, therefore, limited ownership by water users;
- Poor financial controls and lack of financial accountability;
- Limited engagement of the private sector;
- No mechanism for the maintenance of water points and environmental protection.

The exercise took place at four levels: community, district, regional and national. Through this process, a shared vision for future management models of rural water systems was developed. Follow-up actions included the training of technicians to operate the water points, training of committees on bookkeeping, inventory management and accountability issues, and the signing of professional management contracts between the Water Service Board and the committees. These actions have substantially improved the functionality of the water systems in Marsabit County. The approach has been refined and is being scaled-up countrywide by the Kenya Market Assistance Programme funded by DFID and the Netherlands Embassy.

*Chiranjibi Tiwari, SNV Kenya*



# Sharing results with communities

An essential step for SNV is sharing and discussing the results of the mapping with communities and actors in the water sector, either in specifically convened platforms or existing fora. Shared understanding and consensus on follow-up action is achieved through multi-stakeholder validation and learning. In South Sudan the multi-stakeholder platform convened to discuss the initial results of the WASH inventory decided to conduct the inventory country-wide and helped the INGOs participating in the platform to move from an attitude of competition to collaboration.

Translating data collected during mapping into actions is essential to equitable and functional water supply services. In Uganda, mobile phones are being used to enable communities to report water supply breakdowns, both for continuous updates on functionality as well as to trigger maintenance. Similarly, in Mozambique detailed monthly field surveys are directly used by local government to trigger repairs. Local technicians have been trained to submit repair reports to local government for both reporting and support purposes.



Well stocked with spare parts, Kenya

## Improving services

SNVs experience has demonstrated that functionality starts with the choice of technology and the quality of construction. In Ethiopia, SNV and its partners brought together users, operators and regulators to agree on the technology and levels of service. Water Point Mapping showed that current technologies were not meeting the aspirations of users or were too complex to operate and, therefore, stood a high chance of failing. Furthermore, the technologies in use, such as hand pumps, were diverse, making it difficult to maintain and provide spare parts.

A key aspect in ensuring the functionality of rural water supply is how the water points and systems are being managed. Across SNVs various programmes in Africa different models are being used. The suitability of each management model is highly dependent on the context and, at the very least, should address technical, managerial and social challenges. We have observed that solely community-managed models fail to deliver sustained levels of service. The assumption that after construction - often government or donor-funded - communities will operate and maintain water points on their own has repeatedly proven invalid.

To address this issue, SNV focuses on building relations directly between local governments and communities. In Tanzania, Mozambique and Uganda, communities have formal arrangements with local government for requesting and receiving support and line agency accountability is enforced. In addition, SNV is developing alternative models for operation and maintenance including models involving the private sector. The involvement of the private sector as water supply operators and managers and post-construction service providers improves sustainability. A number of countries (among them Kenya, Rwanda, Tanzania and Zambia) have adopted public private partnership models. While there is no 'one size fits all' solution, SNV and its partners are developing and replicating many approaches, which are proving viable in a range of local contexts.

### Private sector management of rural schemes in Rwanda

In Rwanda, SNV supports the government's 2004 policy to use public private partnerships to deliver sustainable rural water services. A Dutch/Rwandan joint venture, AquaVirunga, was contracted by Rubavu district to manage its rural water supply scheme; later this venture won contracts for two more schemes in neighbouring districts, serving a population of 239,000. Despite AquaVirunga's efforts, they were operating at a loss and requested help from the districts, who in turn approached SNV.

SNV identified two main ways of improving performance: reducing water leaks and addressing mistrust between AquaVirunga and its customers who were unaccustomed to paying for water. SNV trained AquaVirunga's local staff, whose income is related to water volumes sales, to locate and fix leaks. SNV also supported AquaVirunga to communicate with communities the improved service benefits of private management.

Within three years, non-revenue water had reduced from 69% to 45% and revenue had doubled. The population using safe water has further increased thanks to AquaVirunga's investment in new infrastructure which it undertook once its business became financially viable.

*Richard Nyirishema, SNV Rwanda*

The last step in SNVs approach is probably one of the most exciting as it is about scaling up. Although this is mentioned as the 'closing' step, its success depends largely on the results achieved earlier. A successful model attracts other districts and donors wishing to replicate this success, benefiting a wider population. 'Everybody wants to join the winning team' is the principle that SNV relies on to achieve impact at scale.

## Connecting people: The SNV way

Connecting ideas and actors with different skills and competences is what SNV does best – and this is exactly what is needed to improve the functionality of water supply services in rural Africa. Capacity building is most effective when SNV uses its local knowledge and champions to identify resources to support our partners and clients. In DR Congo, the low technical capacity of state agencies to design and construct water supply schemes was identified as an obstacle to functionality. SNV brokered an agreement with a local NGO with design and construction skills for the provision of technical support to these agencies.

SNV Kenya, in partnership with Adam Smith International and Kenya Markets Trust, has supported the Kenyan Commercial Bank to access a special guarantee facility for loans to water and sanitation related businesses. The programme, with loans of up to USD 5 million, provides credit opportunities to small-scale water service providers.

In addition to our direct advisory services to clients and partners, SNV aims to increase in-country capacity development by engaging NGOs, civil society organisations and private sector consultants to provide capacity building services to our clients. SNV then supports the selected local capacity builder (LCB) to guarantee quality output and extend the scope and range of their services.

Advocacy is a key component: presenting functionality as a systems problem rather than a narrow technical problem helps people to understand how they can work together to improve water supplies. We support governments and other stakeholders to build a common understanding emerging from lessons and evidence related to our practice.

Combined with our multi-stakeholder approach SNV advocates for concepts and approaches that support the ultimate aim of our functionality programme, which is:

*Improved health and quality of life of men and women by increasing the number of people that are using sustainable drinking water services that meet basic service levels.*

### Innovation: Mobile telephones for water in Uganda

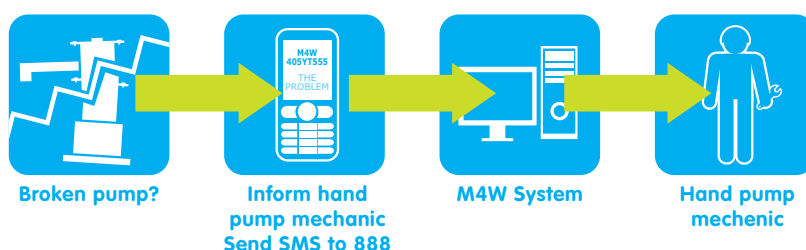
In Uganda, SNV in partnership with IRC/Triple-S and Hivos have launched an innovative approach called Mobile Telephones for Improved Access to Safe Water (M4W). M4W uses mobile phones to improve accountability for the timely repair of technical defects in water systems.

Water users send a short SMS to report a fault at a water source. The report is received by the assigned Hand Pump Mechanic or Scheme Attendant, who is required to attend and assess the fault within 48 hours and send an assessment report to the district. Reminders will be sent by the system in case of non-response.

The initial report is also sent to a central database managed by the District Water Officer on water point functionality.

SNV coordinated with the Ministry of Water and Environment to ensure alignment with the Ministry's policy and strategy, contracted Makerere University to design the software and used local providers to supply the water source labels.

M4W improves efficiency in reporting faults, triggers action, and updates District and National Information Systems in real time.



Inspired by the technology, WaterAid and other partners have joined M4W. Although the technology is at the initial testing stage, seven district local governments, technical staff and community members have already started reporting water point problems by SMS.

*Turimaso Wilbrord and Chemisto Satya Ali, SNV Uganda*

## Water Point Mapping in DR Congo

SNV Congo piloted a Water Point Mapping exercise in three provinces: Bas Congo, Equateur and Kinshasa. In one of the provinces data were collected by a local organisation commissioned by SNV, while in the other two the exercise was implemented by government agencies. A total of 2,051 water points were mapped. Non-functionality was highest in Bas Congo at 68%, 24% in Kinshasa and 14% in Equateur. Bacteriological water testing was carried out in two provinces with alarming results. In Bas Congo only 39% of functional water points provided safe drinking water while in Kinshasa it was just 32%.

SNV introduced the mapping concept and provided staff with training in GPS data collection and processing. Data were collected on different aspects of service provision, including functionality and water quality, and shared at the district level. By being directly involved in all aspects of mapping, participating government institutions are now in a position to undertake future mapping and analysis.

*Claver Hambadiahana, SNV DR Congo*

## Conclusion

Ensuring that safe and sufficient water flows reliably from rural people's taps is a challenging task. Growing populations cannot be served without adequate physical and management infrastructure. The role of decision-makers is fundamental to the challenge of delivering functional water services. Multi-stakeholder platforms enable consistent governance approaches, coordinated efforts and pooling resources to accelerate impact. Proper attention must be given to the institutional, social and managerial factors, which often manifest as technical failures. Addressing the combination of components in a holistic and coherent manner is the key to successful functionality.

Robust project feasibility assessments, appropriate design and quality construction are pre-conditions to functional water supplies. For there to be any chance of successful management, designs need to actually meet user demands, otherwise users are unlikely to be willing to pay for, or spend time on, operation and maintenance. Inappropriate technology selection hinders operation and maintenance training and makes the management of spare parts more difficult than it needs to be.

The role of communities in the management of their water supplies is rooted in participatory approaches to development and reinforced by governments with limited capacity and resources. A fresh look at how communities are prepared for this role is necessary, as current approaches are not working. Complementary and alternative management models have been developed and tested in a number of SNV programmes. Some work in one environment, but fail or need bolstering in another. The lessons learned from these experiences must inform model selection in each specific context. What becomes clear is that community-based management needs to be re-thought and there is an important role for the private sector to play.

Keeping a water point or system running is a shared responsibility. Only when implementers, regulators, operators and users have clear roles and responsibilities for sustained service delivery will functionality be assured. In turn, our practice has found that clarity of roles enables the different parties to hold one another accountable for their part in ensuring use of safe water.

Rural water supply functionality is a complex subject and there is no 'one size fits all' solution. Sharing experiences and learning with others in the water sector is essential to improving functionality.

## Using local capacity to improve functionality in Mozambique

In Mozambique, SNV worked with Águas de Nametil to map, monitor and document water point functionality and later trained local user committees on operation and maintenance. Águas de Nametil was selected in 2008 as a local capacity builder based on its potential to be a change agent in developing sustainable water supplies, influencing the institutional environment, and impacting the lives of communities. Through working with SNV advisors, Águas de Nametil has increased its own capacity to improve functionality. In 2011, Águas de Nametil was assigned to introduce and implement an operation and maintenance logbook in Mogovolas District and coach local capacity builders in Monapo, Mogincual, and Murrupula districts on how to do the same. This led to a cascade of training and skills development in these three districts. Águas de Nametil is also responding to demands for training from other organisations.

In Mogovolas District, 56 water committees were trained and 23 water points were rehabilitated, improving the access of 11,500 people to safe water. The number of customers paying for water also increased as communities now appreciate the value of water services. As local capacity builders are locally embedded, they avoid cultural, language and trust barriers, enabling SNV to expand its geographical impact, reduce costs and increase effectiveness.

*Gilda Uaciquete and Augusto Razulo, SNV Mozambique*



Functional hand pump, Tanzania

SNV is an international not-for-profit development organisation that works in 36 developing countries in Africa, Asia and Latin America.

We help empower local communities, businesses and organisations to break the cycle of poverty by providing them with the tools, knowledge and connections they need to increase their incomes and gain access to basic services.

We do this by providing advisory services, knowledge networking and supporting advocacy in the agriculture, water, sanitation and hygiene, and renewable energy sectors.

To learn more about SNV please visit our website at [www.snvworld.org](http://www.snvworld.org)

## Cases on SNV website

[www.snvworld.org/en/regions/africa/publications/functionality-of-rural-water-supply-services-in-africa](http://www.snvworld.org/en/regions/africa/publications/functionality-of-rural-water-supply-services-in-africa)

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- Case 2:** Preventive Operations and Maintenance (POM) approach for sustainable rural water systems, Ethiopia  
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