IRC

BRIEFING NOTE March 2015 (Reprinted)
Building blocks for sustainability series

triple-s

Self supply: the case for leveraging greater household investment in water supply

Stef Smits and Sally Sutton

POINTS FOR ACTION

➜ **For Governments**

- Recognise self supply as an alternative service delivery model and incorporate self supply into rural water supply strategies
- Include self supply in water service inventories and monitoring
- Provide support to ensure quality of self-supply options through advice and training
- Create supportive regulations, policies, and planning for accelerating self supply – including considerations of equity and water resource protection

➜ **For NGOs implementing rural water supply interventions**

- Raise awareness of self supply as an option and help link potential investors with support services for microfinance, construction, and equipment
- Work with government to pilot models for accelerating self supply
- Package information on technology options, upgrades, and maintenance for potential household investors

➜ **For Donors & International Financial Institutions**

- Recognise self supply as a valid approach that requires some degree of investment in private sector development and public support mechanisms to be sustainable

Public investments in rural water supply extend first to the most accessible communities. Self supply – the development or improvement of water supplies by households largely or wholly at their own cost – is an approach that can help increase coverage in areas where it is not feasible or cost-effective to develop communal supplies. It can also supplement existing services – improving water quality, quantity, reliability, or access.

Photo: IRC

Despite its potential, self supply is often not formally recognised as a model for service delivery in sector policy and institutions. If it is recognised, and supportive policies, regulations, and financing mechanisms are put in place, self supply can provide safe, sustainable services compatible with community-based systems.

Rainwater harvesting, construction and upgrading of shallow wells, and household water treatment all lend themselves to household investment.

WHY INVEST IN ACCELERATING SELF SUPPLY?

The household-driven nature of self supply begs the question: Why should government get involved? The main reason is that the full potential of self supply is not being reached. This model can help bridge the funding gap for rural water supply (few countries have reached 100% coverage without it; see Box 1), and it can leverage private investment to boost service levels. Countries that have encouraged self supply, such as Uganda, Zimbabwe, and Thailand, are increasing coverage and levels of service in rural areas where conventional service is inadequate or difficult to provide sustainably. In addition, government support can improve the quality of self-supply options and their sustainability, which is already high compared with communal services.

Bridging the funding gap

In sub-Saharan Africa, rates of water supply coverage need to increase by a factor of four, at an estimated cost of US$7 billion, to reach the MDG target of halving the proportion of those without sustainable access to safe drinking water (Foster and Briceño-Garmendia, 2010). Adding to the challenge, the unit cost of water supplies developed under the community-based management approach, the dominant model for providing rural water services, increases as coverage increases. Countries that have reached around 60% coverage have already picked the 'low-hanging fruit' of easily accessible, better-organised communities. Now, the unit cost of reaching the remaining unserved communities, which are generally more socially fragmented and geographically remote, is becoming prohibitive. For instance, the unit cost of new rural water supply and sanitation schemes in Uganda rose by 35% between 2004/5 and 2008/10 as coverage rose from 61% to 65% (MWE, 2006, 2010).

With the right support from government, self supply can help fill part of the funding gap for rural water supply by leveraging household investments – and do it without sacrificing equity goals. Household spending already contributes around half of all capital investments in water and sanitation in sub-Saharan Africa. Although investments in household sanitation represent the greater portion of this figure, many families typically spend US$50–100 on traditional wells with basic protection.

In remote rural areas in Zambia, government's per capita costs for the most expensive phase for self- supply acceleration, the start-up, are a quarter to a third of the cost for community service (Kumamaru, 2011). This ratio becomes even more favourable as self-supply services multiply at little or no additional cost and no capital maintenance expenditure. In Uganda, the self-supply approach may have reduced costs to government by as much as 85% compared with a community water system (Danert and Sutton, 2010).

Improving service and sustainability

Self supply can supplement existing services that are unreliable or inadequate for some uses. And it can upgrade service levels in terms of water quality, quantity, and access. Such improvements may also reduce demand on community services.

Public supply systems are often poorly maintained and suffer frequent breakdowns (RWSN, 2010). In contrast, people who invest in their own water supply, choose the technology, and have a vested interest in the service are more likely to develop sustainable systems. Research bears this out: household-managed options tend to outperform communal options in sustainability and service delivery. In Zimbabwe, for example, 88% of private family wells were working in 2006, versus only 72% of communal deep wells and boreholes (UNICEF/NAC, 2006), and in Zambia, the Kaoma District WASH committee found that 94% of the 3,640 family wells were functioning in 2001, versus 49% of 321 communal protected wells (WSP, 2004).

BOX 1 ACHIEVING UNIVERSAL ACCESS

Few countries achieve universal access without self supply. Two developed-country examples:

- In the United States, more than 14% of the rural population supplied its own water for domestic use in 2005, chiefly from groundwater sources (USGS, 2009). Using grant money, NGOs make low-interest loans on a revolving fund basis to homeowners in remote areas where public supply is not cost-effective.
- In Ireland, 75% of the rural population is served by water mains. The remaining, more dispersed households that public services cannot reach provide their own water, investing individually or in small groups in wells and spring capture (Brady and Gray, 2010).

Photo: Petterik Wiggers, Panos

WHERE CAN SELF SUPPLY HELP?

Self supply is prevalent where people have no public service at all, or wish to improve on existing services that do not satisfy their needs in terms of quality, quantity, reliability, or access. Three types of context can be distinguished.

Extending service to those without access

In rural areas where community water supply coverage is low, shallow wells and rainwater harvesting can improve access for many millions of people. In general, the supplies are of low quality and the technologies are basic, but wellhead protection and installation of lifting devices are simple, low-cost improvements. The water is almost always shared with neighbours. Examples:

- In Nicaragua, rural water supply coverage rose by 24% in seven years as a result of families' investment in rope pumps (Alberts and van der Zee, 2003).
- In large areas of Mali, about 20% of households have excavated their own unlined wells. This is equivalent to an investment of more than US$10 million, undertaken by some of the poorest people in Africa (WSP, 2009; Sutton, 2010c).

Supplementing substandard service

Where public supplies are inadequate, intermittent, distant, or of poor quality, many rural and peri-urban families augment service with rainwater storage or backyard wells. Examples:

- In Thailand, the majority of rural households supplement piped service, which is often substandard, with rainwater harvesting jars for their drinking water.

BOX 2 A WATER ENTREPRENEUR

One Ghanaian well owner used a bucket and rope to supply water to his guesthouse in Kofridua because the stand post was far away and unreliable. After selling water to his neighbours for a while, he used the accumulated income and a loan to purchase a motorised pump and elevated storage tank. He then started chlorinating the water and having it tested. He now provides a more reliable and convenient service than the local public utility and will soon sell house connections (Sutton, S. unpublished field notes).

- In Vietnam, private mechanised wells provide additional water to support pig farming and other smallscale enterprises.

Replacing substandard service

At the periphery of a piped system in an urban or peri-urban area, the public supply is often intermittent and poor in quality. Some households invest in an alternative supply and begin selling water by the bucket and even expanding to household connections (Box 2). This solution may evolve into a hybrid service model between self supply and private operators. Examples:

- In India, the slippage from 95% coverage to 67% (Ratna Reddy et al., 2010) is partly mitigated by private supplies at the household level, as found in Bihar (Taru, 2005).
- In Ghana, an estimated 14% of rural supply coverage is from private or self-supply services (IRC and Aguaconsult, 2011).

BOX 3 REDUNDANCY IN SENEGAL

Most of Senegal has no easy access to alternative supplies, such as groundwater, and a public system for most rural areas is essential. Rural piped systems have led to dramatic and sustained coverage over much of Senegal. In the South, however, groundwater is more available: users have free and convenient supplies from traditional household wells for bulk domestic uses, and take only drinking and cooking water from the public supply. Here, the public piped system often operates at only 10% capacity. Because the system duplicated service from existing self supply, much investment may have been wasted, and sustainability is threatened.

WHAT LIMITATIONS DOES SELF SUPPLY HAVE?

The self-supply model comes with some challenges:

- Government and NGO workers may need training because self supply is fundamentally different from the community-based model: instead of developing and financing supplies, government agencies offer advice and support so that users can develop their own service.
- It can be difficult to determine whether and where self supply can be supported. Not all forms of self supply are feasible everywhere, and in some cases self supply may not succeed.
- Accelerating self supply requires up-front public investment – for promoting the idea, identifying appropriate technologies, establishing supply chains, and possibly providing incentives and subsidies – yet the benefits are initially unpredictable and may not appear in the short term if early uptake is slow.

Self supply also raises concerns about quality, equity, and environmental sustainability:

- Low-cost technologies and private supplies are usually associated with lower levels of water quality than community supplies, although the extent to which this is true has not been well studied.
- Although in general they have proved more sustainable than communal systems, household systems can also fail from lack of money, parts, or skill in maintenance or repair.
- Self supply may not address the needs of the very poor, since households need initiative and some start-up capital or access to loans to develop their own water supply. However, options such as rainwater harvesting are within reach of most. And often self-supply households provide water for free or for a small charge to those who cannot afford their own supply.
- Widespread uptake of self-financed wells may draw down groundwater levels if they are also used for productive activities, such as irrigation and cottage industries.

In addition, public planners need to coordinate self supply with public systems. One mistake to avoid is duplication of public and household efforts (Box 3).

The limitations can be addressed only if self supply is treated as a formal service delivery model, alongside community-based management, with private and public support services and information.

HOW CAN SELF SUPPLY BE ACCELERATED?

Governments can encourage self supply first by recognising the approach in sector assessments and investment plans to enable better targeting of public funds to leverage household investments and fill financing gaps. This may require adjusting project cycles, institutional roles, and financing mechanisms.

At the local level, accelerating self supply involves establishing advisory, marketing, and support services, including (micro)finance, help in identifying appropriate options, and promotion of technologies and supply chains that allow for future development. NGOs can be effective partners in this step (Box 4).

At the household level, acceleration requires better awareness of the costs and benefits of developing one's own supply, which range from return on investment through productive uses (which communal supplies usually cannot accommodate) to prestige, privacy, and time savings.

Photo: Petterik Wiggers, Panos

BOX 4 NGO-GOVERNMENT PARTNERSHIPS

By providing training, information, and some building materials, such as concrete, the Blair Research Institute and Zimbabwe's Ministry of Health encouraged more than 125,000 family well owners to install wellhead protection and lifting devices. These well owners improved their service, and other households were motivated to dig their own wells. More than 2 million people thus moved from 'no service' to at least a substandard or basic level of service, which in 2005 constituted some 50% of functioning rural water points (WSP, 2002; UNICEF/NAC, 2006).

A process for accelerating self supply

Development of any new service delivery model is a gradual and context-specific process that often does not proceed linearly. But generally speaking, it resembles the process mapped out in Figure 1. It starts with an enabling environment that stimulates interest from users. The national-level government develops general policy functions, and self supply becomes a formal part of the country's efforts to meet its drinking water target. Over three to five years, government actions devolve to lower levels, and local governments build capacity, promote self supply, and provide technical advice. Their role then transitions to monitoring progress and support services.

Roles and responsibilities

In the service delivery model for self supply, the national government has policy and normative functions:

- inclusion of self-supply services in national monitoring and assessments;
- determination of policies on subsidies for self supply;
- promotion of investment in water supply (e.g., tax incentives);
- research and development on low-cost solutions;
- development of information for households, quality standards for installers, and guidelines on maintenance and repair;
- pilot programmes;
- advice and training for local governments; and
- regulation of any self-supply initiatives that evolve into for-profit service.

FIGURE 1 STAGES IN ACCELERATING A SELF-SUPPLY SERVICE DELIVERY MODEL

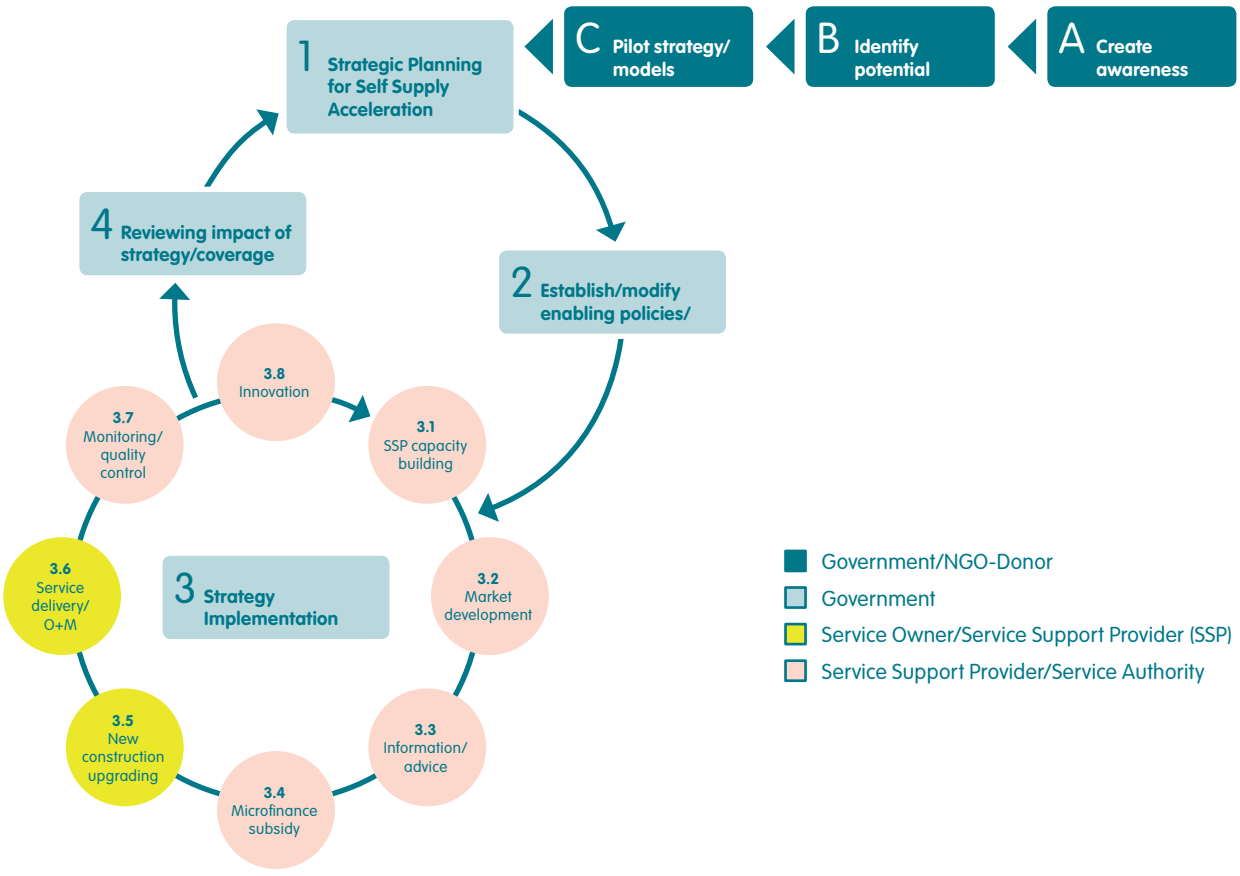


Photo: IRC

Local government works with organisations involved in the water sector, including water supply, agriculture, health, finance, and education, using their structures for promoting self-supply options and providing support to individual households. Its functions are similar to those in a community-based management model:

- promotion of self-supply technologies that meet users' different needs;
- technical advice and demonstrations;
- financial incentives or other support to encourage improved technology;
- capacity building and quality control;
- contracting of technical and vocational training courses in pump installation and repair;
- monitoring of self supply alongside monitoring of community supplies; and
- fine-tuning of the successful approaches.

Individual households that invest in self supply play a role in acceleration by spreading word of the benefits to friends and neighbours. They have the following responsibilities:

- investment, management, and ownership;
- contracting out or undertaking construction themselves;
- maintenance, replacement, and upgrades; and
- decisions on any water fees for neighbours who use the supply.

Support service providers – traders, drillers, well diggers, pump producers, water diviners, masons, and artisans – help the model spread by marketing their services:

- construction and protection;
- production, procurement, and stocking of equipment; and
- maintenance and repair.

TABLE 1 COST CATEGORY RESPONSIBILITIES

Cost category	National government	Local government	Supply owner	Support service provider
WATSAN committee	—	Start-up for revolving funds	Usually 100%*	Equipment 100%
Cost of capital (e.g., loans)	—	Service costs for loans or revolving funds if not covered by supply owner or support service provider	Usually 100%*	100% of any loan interest
Operation, minor maintenance	—	—	Usually 100%	—
Capital maintenance	—	—	Usually 100%	—
Direct support	—	Technical assistance	—	—
Indirect support	Promotion, quality control, R&D, training, monitoring, regulation if appropriate	Promotion, technical advice, capacity building, quality control of support services, vocational training, monitoring if appropriate	—	Marketing

* Less if government provides incentives or subsidies for materials

[1] For an assessment of costs for household rainwater harvesting see "Life-cycle costs of rainwater harvesting systems" by C. Batchelor, C. Fonseca, and S. Smits (2011) www.ircwash.org/resources/life-cycle-costs-rainwater-harvesting-systems

Cost sharing

For a government, the very low initial costs make self supply attractive, but some public investment is essential to create an environment that allows self supply to develop in coordination with other services. The government's involvement is also necessary to ensure that self supply creates synergy with community services and does not proceed haphazardly as a low-quality last resort for those left out of community-based services.

Per capita, self supply is not always cheaper than communal systems, which enjoy economies of scale[1]. But to the self-supplier, the unit capital cost is more critical than the per capita cost: can he or she afford the well, pump, and storage tank? Individuals, especially those of limited means, are generally willing to pay more for systems they own and manage themselves than for communal supplies (WSP, 2004).

The expectation that supply owners make the full up-front capital investment raises the question of equity. Community systems are almost always heavily subsidised; should governments partially subsidize self-supply investments by households? Uganda makes grants to households whose only possible supply is rainwater harvesting. Zimbabwe in the 1990s provided a subsidy of some 20% of capital costs for upgrading family wells; the amount was low – around US$2 per head (WSP, 2002) – but effective. Some developed countries also use subsidies to encourage self supply (Box 1).

Models range from no subsidy to incentives (loans or gifts) to central funding for capital works. The balance between public and private funding will depend on a government's financial situation and policy on funding individual initiatives.


Photo: IRC

Strategic steps for accelerating self supply

- **Assess the current state of self supply:** Include self supply in sector inventories and performance assessments. Look at current self-supply practices: type, level of service, constraints and benefits.
- **See how self supply could fit into current strategies and plans:** Assess progress towards water sector goals (MDG and/or national targets) and assess whether and how self supply could play a role.
- **Identify high-potential areas and estimate demand:** Look at areas where (1) public supply is problematic or not cost-effective and (2) households could tap alternative water supplies. Places that meet both criteria have high potential for self supply.
- **Identify strategic opportunities to improve service:** Move from the absolute concept of 'served' and 'not served' to the incremental concept of service levels. Look for areas where relatively small investments to encourage household investment could boost existing services (even those in the 'unimproved' category) to the next level.
- **Learn from others:** Review experience from countries where household investment has raised service levels and increased coverage[2], and exchange information with decision-makers in those countries.
- **Pilot service options:** Test different technologies, financing mechanisms, and roles for government, private sector, NGOs, and users. Based on the pilots, prepare working models that describe preferred technology, financing, and roles, and incorporate these models into polices and plans.
- **Document progress** to feed your own learning and that of others.

[2] For example, see case studies on accelerating self supply from Zambia, Ethiopia and Mali by S. Sutton (2010) and from Uganda by K. Danert and S. Sutton (2010). Available at: www.rural-water-supply.net/en/resources-top/sort/year-desc/filter/1

REFERENCES

Alberts, J.H. and Van der Zee, J.J., 2003. A multi-sectoral approach to sustainable rural water supply: The role of the rope handpump in Nicaragua. *Proceedings of international symposium on water poverty and productive uses at the household level.* Muldersdrift, South Africa.

Brady, J. and Gray, N.F., 2010. Group water schemes in Ireland: Their role within the Irish water sector. *European Water*, 29, pp.39-58.

Danert, K. and Sutton, S., 2010. *Accelerating self supply: A case study from Uganda.* St. Gallen, Switzerland: RWSN.

Foster, V. and Briceño-Garmendia, C. eds., 2010. *Africa's infrastructure: A time for transformation.* Washington, DC: Agence Francaise de Développement in association with the World Bank.

IRC and Aguaconsult, 2011. *Ghana: Lessons for rural water supply; assessing progress towards sustainable service delivery.* The Hague: IRC International Water and Sanitation Centre.

Kumamaru, K. 2011. *Bridging the gap between community and household water supplies.* PhD Thesis. WEDC, Loughborough University.

MWE, 2006. *Uganda water sector performance report.* Kampala: Ministry of Water and Environment.

Ratna Reddy, V. et al., 2010. *Slippage, the bane of drinking water and sanitation sector.* Washcost (India).

RWSN, 2010. *Myths of the rural water supply sector.* St. Gallen, Switzerland: Rural Water Supply Network.

Sutton S., 2010. *Accelerating Self Supply: A case study from Mali.* St. Gallen, Switzerland: Rural Water Supply Network.

Taru, 2005. *Rural water supply and sanitation sector assessment study for Bihar.* UNICEF.

UNICEF/NAC, 2006. *WASH inventory atlas Zimbabwe: Inventory of the national rural water supply and sanitation facilities (2004).* Harare: UNICEF and National Action Committee for Rural Water Supply and Sanitation.

USGS, 2009. *Estimated use of water in the United States in 2005.* Circular 1344. Washington, DC: U.S. Geological Survey.

WSP, 2002. *Up-graded family wells in Zimbabwe: Household-level water supplies for multiple uses.* Field note 6.

WSP, 2004. *Self supply: A fresh approach to water for rural populations.* Field note. Nairobi: WSP-Africa.

WSP, 2009. *An introduction to self supply, putting the user first.* Field note, January.

About IRC
IRC is an international think-and-do tank that works with governments, NGOs, businesses and people around the world to find long-term solutions to the global crisis in water, sanitation and hygiene services. At the heart of its mission is the aim to move from short-term interventions to sustainable water, sanitation and hygiene services.

With over 40 years of experience, IRC runs programmes in more than 25 countries and large-scale projects in seven focus countries in Africa, Asia and Latin America. It is supported by a team of over 100 staff across the world.

For more information go to: www.ircwash.org.

About the Building Blocks for Sustainability series
This briefing series was developed under IRC's Triple-S project. It is intended as a resource for people who make decisions about rural water supply – financing, policy and programme design and implementation. It outlines the basic building blocks for sustainable delivery of water services – such as indicators and targets, aid harmonisation, and professionalisation of community management – and provides evidence and examples from actual practice.

For more publications in this series, go to: www.ircwash.org/buildingblockbriefings

About this Brief
This brief was authored by Stef Smits of IRC and Sally Sutton of SWL Consultants. It builds on the series of RWSN briefings on accelerating self supply by Sutton and others and the studies of the rural water supply sector in 13 countries carried out under Triple-S. It was reviewed by Harold Lockwood of Aguaconsult and John Butterworth of IRC.

For additional resources on self supply go to: www.rural-water-supply.net/en/self-supply and www.ircwash.org/news/alternative-service-provider-options

Visiting address
Bezuidenhoutseweg 2
2594 AV The Hague
The Netherlands

Postal address
P.O. Box 82327
2508 EH The Hague
The Netherlands

T +31 70 304 4000
info@ircwash.org
www.ircwash.org