

Water Resource Quality (WRQ)

Geogenic Contamination Handbook

Addressing arsenic and fluoride in drinking water

Chapter 6 Financial viability for drinking-water services	3
6.1 Financial options for water service providers	4
6.2 Consumer contributions to water services	7
6.3 Summary	8



**WHO Collaborating Center
for Sanitation and Water
in Developing Countries**

eawag
aquatic research **ooo**

Dübendorf, January 2015
Revised and updated 2017

© **Eawag: Swiss Federal Institute of Aquatic Science and Technology**

P.O. Box 611, Ueberlandstrasse 133, 8600 Dübendorf, Switzerland

Editors

C. Annette Johnson, Anja Bretzler

Layout

Ruth Scheidegger

Authors

Hans-Peter Bader, Michael Berg, Anja Bretzler, Heiko Gebauer, Alexandra C. Huber, Stephan J. Hug, Jennifer Inauen, C. Annette Johnson, Richard B. Johnston, Christoph Lüthi, Nasreen Khan, Hans-Joachim Mosler, Lars Osterwalder, Linda C. Roberts, Ruth Scheidegger, Robert Tobias, Hong Yang

Bibliographic Reference

Eawag (2015) Geogenic Contamination Handbook - Addressing Arsenic and Fluoride in Drinking Water. C.A. Johnson, A. Bretzler (Eds.), Swiss Federal Institute of Aquatic Science and Technology (Eawag), Dübendorf, Switzerland

Cover Photo:

Women collecting fluoride-treated water at the community filter in Wayo Gabriel, Ethiopia, implemented by Eawag, Oromia Self-Help Organization (OSHO) and Swiss Interchurch Aid (HEKS)

This document or parts of it may not be reproduced or distributed for commercial purposes of any kind.

6 Financial viability for drinking-water services

Heiko Gebauer and Caroline Saul

Drinking-water services often fail for the low-income segment living close to the poverty line – not only in terms of quantity and quality, but also in terms of affordability and accessibility (Anderson and Markides, 2007; WHO, 2012; Massa, 2012; Gebauer and Saul, 2014). The low-income segment often suffers from a “poverty penalty”, where the least privileged pay more for drinking water than their richer counterparts. The low-income segment does not benefit from subsidies for water provision, or it simply lacks access to adequate water quality and quantity. Arguably, improving access to and affordability of sufficient quantity and quality of drinking water should be guaranteed for people living close to the poverty line.

The financing of water services remains a major concern. Typical key and follow-up questions are:

- How can I finance the production, distribution and marketing of water treatment options? Where can I get funding from? Can I apply for funds from the government? Can I get access to philanthropic money? Is patient capital available? Do I have to invest my own money?
- What types of cost do I have to cover? How can I identify the necessary costs? What would be a good cost ratio between investment and operational costs?
- How can I ensure that people pay for water services? How do I collect payments from the users?

Philanthropy and donation-based aid programs can make an important impact on the quality and quantity of water services, but they are inherently not economically sustainable. Once the financial resources have been invested in one location, there are often no finances remaining to transfer the water service programmes to another location (up-scaling) or provide for the continued operation and maintenance of the initial site.. On one hand, financial viability means that water providers should at least break even – or even attain profitability and a competitive rate of return. This would enable organisations to re-invest in the extension of water services. Non-profit organisations and social businesses providing water services may pass on all savings and profits to their members or may use them to expand their scale and scope of water services. On the other hand, subsidies might be necessary to facilitate the development and use of water services.

The next few sections discuss the key issues on financial viability for water services. Our basic rationale is that financial viability can only be ensured if the water service providers cover the investment and operational costs and are able to manage a certain contribution paid by the consumers for water services. The discussion is divided into two parts. First, we describe financial options for the water service providers. Second, we highlight ways for

water service providers to ensure that the consumer pays for the services provided. It should be noted that the following sections mostly include examples of the treatment of microbially contaminated water, as there is great activity in this field and because the financial issues are independent of the type of contamination.

6.1 Financial options for water service providers

There are different types of water service providers:

- Utilities can be private or public. They manage water treatment units and centralised water networks.
- Micro-utilities are owned by communities. They manage small-scale water treatment units and a decentralised water network.
- Water kiosks are booths that sell drinking water (usually treated). They may also deliver water directly to households.
- Providers of treatment devices for household use.
- Providers of disinfectant products, such as chlorine tabs that are used for water disinfection.

All these providers can use different financial options to invest in water service provision. The financial option depends on the type of organisation (Fig. 6.1) providing the water services. There are three general types of organisation.

- 1 **Profit-orientated businesses:** Profit-orientated businesses recover their investment and operational costs, generate revenues with the water services and maximise their profits. Typical examples are multinational enterprises such as Unilever, which sells its [Pureit Water Filter](#) to generate profit, or smaller firms such as the Indian [Sarvajal](#) or the [WeConnex](#), that sell water treatment equipment for profit.
- 2 **Non-profit organisations:** Non-profit organisations do not recover the investments and operational costs. Instead they rely on donors and aid finances to cover these costs. See [NWP/IRC \(2009\)](#) for a listing of donors financing water services. A typical example would be [A Vision for Clean Water](#), which finances Kanchan arsenic removal filters through donations. Publicly owned utilities also act as non-profit organisations using a mix of user fees and tax revenues to manage water services. They still aim to recover investment costs and generate enough profit to cover operation and maintenance costs.
- 3 **Social businesses:** Social businesses borrow elements from profit-orientated businesses and non-profit organisations. Social businesses have to cover the investment and operational costs, but they are more cause- than profit-driven. A typical illustration would be [the Naandi Foundation](#), which sets up water kiosks in

6 Financial viability for drinking-water services

rural India. Costs are recovered by selling 20 litres of water. In addition, some of the investment costs are covered by subsidies. . Another illustration of a social business is OSHO ([Oromo Self-Help Organisation](#)), which receives funding to install community-based water systems and generates revenues by selling the filter material to treat the water.

All three types of organisation have to consider their investment and operational costs. Investment costs include all necessary costs to purchase the water treatment equipment and distribution infrastructure. In the case of the Naandi Foundation, investment costs can be as much as \$10,000 for a water kiosk. Investment costs for individual household treatment options are much lower, for example Unilever's Pureit water filter can be purchased for as low as \$40. Operational costs include the costs for operating and maintaining the water treatment equipment

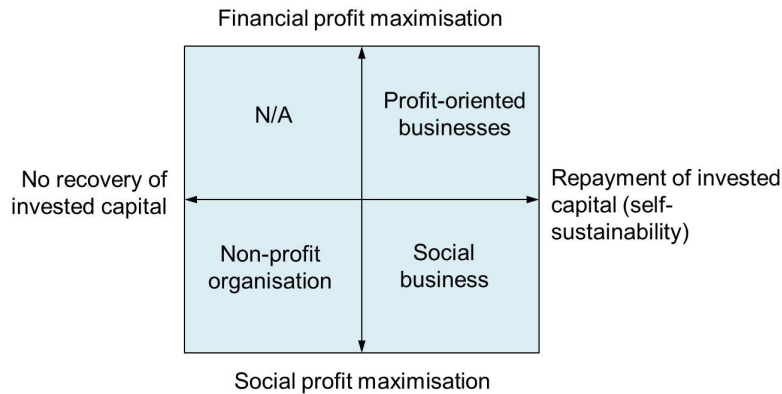


Fig. 6.1 The orientation of different types

Operational costs cover a variety of expenditures, such as operator labour costs, repair costs, electricity costs, costs for filter media and so on. Organisations often refer to life-cycle costs (LCC). LCC analysis is a method for assessing the total cost of ownership of water treatment equipment. LCC analysis takes into account all the costs of designing, acquiring, owning, and disposing of water treatment equipment. Acquisition costs refer to the investment costs, while ownership costs are close to operational costs.

Profit-orientated firms, social businesses and non-profit organisations can source the necessary capital through philanthropy, as investment capital or patient capital.

Philanthropy: Philanthropic activity can be described as caring for, nurturing, developing and enhancing "what it is to be human" on both the benefactors' side (by identifying and exercising their values in giving and volunteering) and beneficiaries' side (by benefitting). In water service provision, philanthropy is usually associated with private donations and corporate philanthropy. The most typical philanthropic activities are private initiatives, for public good, focusing on quality of life. Each private donation is supplemented by a philanthropic investment by Procter&Gamble. Philanthropy and donation-based aid programmes can make an important impact, but they are

6 Financial viability for drinking-water services

inherently not economically sustainable. Once the financial resources are used in serving one community, region or country, there are no funds remaining to transfer the water service programme to another location. Investment capital and patient capital offer attractive alternatives, because they can be economically more sustainable.

Investment capital: Investment capital is money that is invested in a profit-orientated firm. The investment is recovered through revenues generated by the firm over several years. Revenues are expected not only to cover the initial investments, but should also generate a competitive rate of return. Investment capital is used for the initial set-up or expansion, rather than for day-to-day operations (operational costs).

Patient capital: Patient capital has a long-term perspective and has gained importance with the rise of social businesses. Patient capital investors are willing to forgo maximum financial returns for social impact. Patient capital has greater tolerance for risk than traditional investment capital, and longer time horizons for returns are expected. As illustrated in Figure 6.2, patient capital is not philanthropy. It is an investment intended to achieve below market-rate returns (or internal rates of return). Patient capital maximises social impact and catalyses the creation of water markets. On the spectrum of capital available to non-profit organisations, social businesses and profit-maximising firms, patient capital combines traditional venture capital, philanthropy, development aid and foreign direct investment. Patient capital is invested in water entrepreneurs that are starting companies and organisations that provide water services.

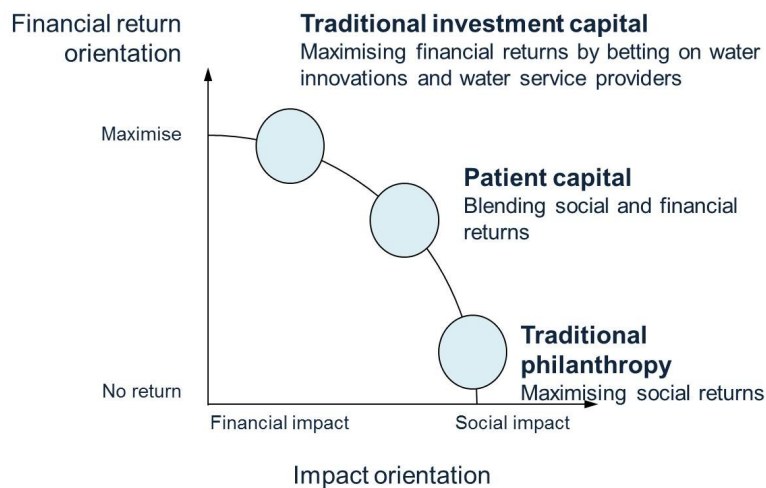


Fig. 6.2 The orientation of different investment types

6.2 Contributions to water services

In addition to charging a water tariff, there are additional options for upholding revenues while increasing the population that is served including: (1) mobile payment systems, (2) micro-credits and (3) consumer subsidies.

Mobile payments systems: Water service providers should explore the opportunities arising from mobile payment systems. Mobile payment systems can significantly reduce transaction costs. Customers can pay very small amounts, which suits the volatile and complex cash flows in the low-income segment, where customers frequently receive their income on a daily rather than weekly or monthly basis. Mobile payment systems also help to reduce collection costs and payment defaults.

Micro-credit: Micro-credit is a component of microfinance, or banking for the “unbanked”, which facilitates access to small loans, often in the form of group lending. They are used in various ways. The Indian company Sarvajal uses microcredit to enable entrepreneurs to finance the initial investments required for entering franchising agreements. Entrepreneurs can receive a loan, which enables them to start a Sarvajal water kiosk. Unilever enters partnerships with microfinance institutes to propose small loans to self-help group members for the purchase of water filters. The [Water Initiative](#) promotes more expensive and effective filters through leasing models. Micro-credit contributes to financial viability in at least two ways. First, water service providers can partner with microfinance institutes so that community members can borrow money for buying filters or disinfection products. Microfinance institutes lend the money to community groups, which know more about the loan takers (community members) than outsiders, such as official banks or water service providers. Partnerships with microfinance institutes enable the water service providers to transfer some of the screening and monitoring costs. Secondly, while water service providers typically cannot impose either financial or non-financial sanctions on people who default on a loan, community members who might belong to the same village or who are neighbors, relatives or friends might be able to impose effective social pressure on each other at low cost.

Subsidies: Here we are referring to consumers needing subsidies to be able to afford safe water. Subsidies can come from local, regional or national governments. The poorest of the poor in particular may need targeted financial support to purchase water filters or reduced water tariffs. Managing such subsidies does, of course, bring its own challenges. To target the poorest of the poor, it is important to identify the various household income levels and to discriminate between them to avoid an unfair distribution of subsidies ([Easterly 2005](#)). Tiered payments can be privately and sensitively managed, using electronic payment methods, such as prepaid cards or mobile payments.

6.3 Summary

Water service providers, such as utilities, micro-utilities, water kiosks, sellers of water treatment devices and the providers of chemical treatment options such as flasks and tabs, have to ensure that they remain financially viable. For non-profit organisations, financial viability depends on getting access to philanthropic investments. Profit-orientated companies have to ensure that their investments create sufficient revenue to recover the investments and to create an appropriate rate of return. Social businesses rely on patient capital, which offers a more long-term perspective, focuses on social impact and aims at a low rate of return. Profit-orientated companies and social businesses need to ensure that the consumers pay for the services provided. Subsidies for the very poor, mobile payment systems and micro-credits are promising ways to tackle these challenges. Table 6.1 summarises the answers to our key questions:

Table 6.1 Answers to key questions on the financing of water services

<p>How can I finance the production, distribution and marketing of water treatment options? Where can I get the money from? Do I have to invest my own money?</p>
<p>The answers to these questions depend on the type of organisation:</p> <ul style="list-style-type: none"> • Non-profit organisations finance water services from external sources, such as donors or government. • Social businesses finance water services through patient capital and contributions from consumers (water users). • Profit-orientated organisations have to invest their own money and expect a financial return on their investments with a certain interest rate. New investments are financed through these revenues. <p>All these types of organisations can also receive subsidies from the government. Such subsidies should specifically target the poorest of the poor.</p>
<p>What types of cost do I have to cover, and how can these be identified? What would be a good cost ratio between investment and operational costs?</p>
<ul style="list-style-type: none"> • Important costs are investment and operational costs. • LCC-analysis (life-cycle cost analysis) is most suitable for identifying these investment and operational costs. <p>Good cost ratios between investment and operational costs are 10:1 to 5:1.</p>
<p>How can I ensure that people pay for water services? How do I get the money from the users?</p>
<ul style="list-style-type: none"> • Mobile payment systems and pay-per-use approaches are most suitable to motivate people to pay for water services. • Micro-credit for financing water services help consumers to avoid up-front investments.

References and further reading

- Anderson J., Markides C. (2007) Strategic innovation at the base of the pyramid. MIT Sloan Manage. Rev. 49 (1), 83–88.
- Easterly W. (2005) The utopian nightmare. Foreign Policy 150(Sept/Oct), 58-64.
- Gebauer H., Saul C.J. (2014) Business model innovation in the water sector in developing countries. Sci. Total Environ. 488–489 (Aug), 512–520.
- Massa I. (2012) Sub-Saharan Africa in global trends of water investment. Drivers and the challenge of the private sector. European Report on Development. Overseas Development Institute (ODI) in partnership with the Deutsches Institut für Entwicklungspolitik (DIE) and the European Centre for Development Policy Management (ECDPM).
ec.europa.eu/europeaid/sites/devco/files/erd-consca-dev-researchpapers-massa-20110101_en.pdf
- NWP/IRC (2009) Smart finance solutions – Examples of innovative financial mechanisms for water and sanitation. Netherlands Water Partnership (NWP), International Water and Sanitation Centre (IRC), The Netherlands.
www.samsamwater.com/library/Smart_Finance_Solutions.pdf
- WHO, World Health Organization (2012) Progress on drinking water and sanitation 2012. WHO/UNICEF Joint Monitoring Programme (JMP). Geneva: Switzerland.
www.who.int/water_sanitation_health/publications/2012/jmp_report/en/
- Yunus M., Moingeon B., Lehmann-Ortega L. (2010) Building social business models: Lessons from the Grameen experience. Long Range Planning 43(2–3), 308–325.

Links with further information

Water service providers

Access to Safe Water for the Base of the Pyramid (Report) <http://hystra.com/safe-water/>

Safe Water at the Base of the Pyramid (Booklet)
http://static.squarespace.com/static/51bef39fe4b010d205f84a92/t/51f23b56e4b05adf4a8ee570/1374829398315/Access_to_Safe_Water_for_the_BoP_FULL_REPORT.pdf

Financing WASH services

Financial Sustainability of WASH Services (SSWM Toolbox)
www.sswm.info/category/planning-process-tools/programming-and-planning-frameworks/frameworks-and-approaches/sani-9

Various publications on financing WASH services (Trémolet Consulting)
www.tremolet.com/publications

Patient capital

Patient capital http://en.wikipedia.org/wiki/Patient_capital

Acumen makes investments that generate both social and financial returns
<http://acumen.org/investments/investment-model/>

Investment and operating costs

Operating cost http://en.wikipedia.org/wiki/Operating_cost

6 Financial viability for drinking-water services

Life-Cycle Costs (LCCs)

Life-cycle cost approach www.ircwash.org/resources/briefing-note-1a-life-cycle-costs-approach-costing-sustainable-service

Mobile payment systems and financial services in developing countries

Mobile Water Payment Innovations in Urban Africa (Report)
www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/Mobile-Water-Payment-Innovations-in-Urban-Africa.pdf

Trends in Mobile Payments in Developing and Advanced Economies
www.rba.gov.au/publications/bulletin/2013/mar/8.html

The mobile financial services development report 2011 http://www3.weforum.org/docs/WEF_MFSD_Report_2011.pdf

The Economist: "The Bank of SMS"
www.economist.com/blogs/graphicdetail/2012/04/daily-chart-12

