Introduction

Overview

This report synthesises available information about the benefits of investing in drinking water supply and sanitation services (WSS), with the goal of making this information more widely available to policy makers in both OECD and non-OECD countries.

Key policy questions explored in this report include:

- What do we know about the benefits that are generated by the delivery of WSS?
- Do current levels of investment appear to be sufficient with regard to the potential benefits?
- Should WSS receive higher priority in the allocations of public budgets than at present?

For the purpose of this study, water and sanitation services (WSS) are defined as the services provided through man-made capital for supplying drinking water and sanitation services. WSS customers may include households but also commercial and industrial users. In some cases, industrial users may invest in their own water supply or wastewater treatment capacities: this means that they are effectively providing such services to themselves.

The study examines the investments needed to ensure sustainable provision of WSS services alongside the WSS "value chain". Although providing access to water and sanitation services is usually considered a priority (as reflected by the focus on access placed via the Millennium Development Goals), adequate investments are needed both downstream and upstream from providing access in order to ensure sustainable services. The report examines whether or not it makes sense to allocate funds to the sector as a whole and which elements of the WSS "value chain" are likely to yield most benefits from investment.

Downstream from providing access, adequate investment in wastewater collection, safe storage or treatment and disposal is necessary so as to ensure that the impact of wastewater being released in the environment is adequately controlled and good quality of the water resources is maintained. This is linked to the fact that water resources are for the most part renewable resources, which can be recycled as long as they are adequately maintained and not degraded. Recycling and reuse of treated wastewater can reduce the amounts of water consumed and generate by-products that can be used for agriculture or energy production.

Investing in water resource management up-stream, so that sufficient water resources of adequate quality are available over time with limited negative impact on other alternative uses of water is also critical and will become even more so as competition for the resource rises. Balancing supply and demand can be done via protecting and augmenting water resources available for supply, but also through managing water demand (*e.g.* by investing in leakage reduction programmes or water-saving technologies at household level).

In addition, the study points to the importance of coherent investment along the value chain. Indeed, if investments are limited to providing adequate water supply and sewage collection, without proper treatment prior discharging effluent water to the aquatic environment, some of the benefits presented here may not materialise.

The study considers investments in a relatively broad manner, including infrastructure investments (the "hardware") as well as accompanying measures (the "software"). Although the report is more focused on the investments in hardware that can be made alongside the WSS value chain (such as water connections, water treatment plants, wastewater treatment plants, transport networks, etc.), the benefits of investing in the software that is necessary to get the overall sector to operate sustainably, such as to plan and implement institutional and tariff reforms, to promote demand management, to conduct hygiene education or manage ecosystems effectively also need to be taken into account, although they are usually more difficult to quantify.

For the benefits of initial investments to be sustained, investment into adequate maintenance must be carried out, in order to ensure the long-term sustainability of such assets. Indeed, WSS investment will only yield benefits if they are adequately operated, maintained and renewed. Too frequently, such investments are not adequately maintained, with close to half of manual handpumps for water abstraction being out of order in Sub-Saharan Africa for example. Evidence of deteriorating wastewater treatment standards has recently emerged in the United States which could be partly caused by insufficient investment in maintaining the assets. The investments needed in adequate maintenance are therefore also considered in this report.

The benefits of such "investments" are considered overall, without seeking to evaluate benefits from public or private investments separately. Other OECD reports have identified the potential sources of funds for the water sector, including tariffs, taxes and transfers to fill the financing gap, and market-based repayable finance to bridge the financing gap (OCDE, 2009a; OCDE, 2009b). Public budgets would typically be used only to partially fill the financing gap or as a lever to attract financial resources to the sector. Private funds would usually be allocated either to pre-finance shared infrastructure or to build private infrastructure (such as in-door plumbing, household latrines or networks used by industrial users or a group of households). The present study does not examine what the best possible combination of public and private funds would be in order to meet the costs of such investments.

The benefits from drinking water and sanitation services are by and large considered from the point of view of household customers. However, it is important to recognise that substantial benefits are also generated for other types of users, such as commercial and industrial users, with subsequent impacts on economic growth, particularly in urban and peri-urban areas. Agricultural users may also be significant beneficiaries, particularly in multi-usage schemes in rural areas.

Why is it important to assess benefits from investing in water and sanitation?

The nature of the benefits stemming from investments and the distribution of these benefits between groups of stakeholders can form the basis for allocating public funds to the sector. Public financing is particularly required where investment can have external effects over a broad range of beneficiaries, if it can reduce the risk of epidemics for example. A better understanding of benefits is therefore critical to define policies for the water sector.

There is a clear demand from policy makers for information on the benefits of investing in water resource management in general and in water and sanitation services in particular. For example, with respect to water resource management in the European context, carrying out economic analysis and gathering data on economic benefits (and costs) is clearly mentioned as an objective in the European Water Framework Directive. For the first time, data on the costs and benefits of investing in WSS in developing countries was presented to senior decision-makers within Ministries of Water and Ministries of Finance at the High-Level Meeting on water, sanitation and hygiene held in Washington, DC in April 2010.

Reliable benefit information can be used to support policy and investment decisions, such as:

- ***To define investment strategies and prioritise investments,*** so that funds can be targeted where net benefits are likely to emerge for the largest group or low-income people (or both, depending on the context and on overall priorities).
- ***To evaluate how benefits are shared between users and inform tariff-setting policies***. Benefits from WSS investments are not equally shared amongst users: whereas benefits from water services are usually experienced at household level, benefits from sewerage services are shared by a community as a whole. Benefit information can provide information on willingness-to-pay for given service improvements and allows allocating additional charges to those who are explicitly benefiting from these service improvements, as they are more likely to be willing to pay for them.
- ***To formulate decisions with respect to the organisation of WSS***. The lack of a coherent analysis on the benefits of investing across the entire value chain of WSS partly stems from a fragmented market structure for service delivery. Although Ministries are in charge of setting overall policy direction, it is usually the local authority and/or the main utility service provider which takes investment decisions, when it may be serving only a small percentage of the population (this is the case in many large cities in developing countries where the main utility provider has failed to keep up with population growth and a large proportion of the population is served by small-scale independent providers). As a result, such a utility seldom considers the benefits (or the disbenefits, in the case of inadequate services) of other types of investments, such as on-site sanitation or water delivery by small-scale water service providers. Information on benefits (or on the costs of inadequate services) could support market structure reforms or better investment coordination between stakeholders in order to take account of the entire value chain of WSS.
- ***To articulate messages towards users of the service on the private and public benefits from the services.*** Some users are simply not aware of key benefits from water and sanitation. For example, the lack of understanding of the health impact of poor sanitation is often a factor of under-investment in on-site sanitation at household level. Estimating such benefits and organising media and promotion campaigns to disseminate these messages can act as a powerful driver for investment.

There is often a disconnect between the perceived benefits from investing in WSS and the actual drivers for those investments. For example, in developing countries, investments in WSS are often justified in public health terms, when in fact the bulk of the benefits come from time gains

and households themselves may be incentivised to invest through a mix of other intangible drivers, such as prestige, shame or general quality of life improvements. Conducting more systematic reviews of benefits (and costs) and understanding better actual investment drivers would allow improving the quality of decision-making.

Structure of the report

The report has six chapters, as follows:

Chapter 1 sets the stage for the rest of the report, giving some background on the size of the investment challenge for water and sanitation and identifying where benefits are likely to emerge from investment along the value chain of water and sanitation services.

Chapter 2 examines the benefits that stem from providing access to water and sanitation services, which is the main focus for attaining the Millennium Development Goals in developing countries. Where historical information is available, benefits from service extension in developed countries are also reviewed in this chapter.

Chapter 3 investigates the benefits of investing downstream in wastewater treatment and safe disposal, in order to minimise the potentially negative impacts of discharging untreated sewage in the environment.

Chapter 4 looks at the benefits of investing in water resource management so as to guarantee sustainable water supply of adequate quality and minimise the potentially negative impacts on other competing demands – including environmental – for water resources. Furthermore, it investigates the benefits of investing in measures to reduce the gap between available supply and demand. On the demand side, it focuses in priority on the benefits arising from the implementation of technical measures (such as leakage reduction, water-saving devices at household level, etc.) but also discusses measures to modify behaviour (including pricing or awareness raising campaigns).

Chapter 5 brings together these different strands of analysis in order to identify where the most significant benefits from investing in water and sanitation stem from. This forms the basis for drawing policy implications, in terms of justifying investments in WSS and prioritising investments along the WSS value chain.

Finally, ***Annex A*** outlines various methodological approaches for measuring benefits and ***Annex B*** contains a list of the key references for this report.