34th WEDC International Conference, Addis Ababa, Ethiopia, 2009

WATER, SANITATION AND HYGIENE:
SUSTAINABLE DEVELOPMENT AND MULTISECTORAL APPROACHES

Coverage as a misleading development goal: the concept of water-person-years

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REVIEWED PAPER 161

Large sums of money have been poured into developing countries by donors, aid agencies and NGOs to improve people's access to water. However, many of the constructed water sources have broken down or are dysfunctional. At the same time, donors, governments and NGOs rush to achieve coverage targets, ambitiously set and inaccurately measured. This paper proposes a new way of measuring the impact of investments. Assessing investments in "water-person-years" over a defined period of time, allows for a more efficient allocation of resources, and calls for a rethinking of the current development approach. Measuring in water-person-years is necessary in order to shift focus from new infrastructure development to operation and maintenance of existing water systems, something that is crucial for sustainability.

Introduction

During the last 40 years, developed countries have invested large sums of money in developing countries to improve their water situation. In an attempt to measure the impact of the money spent, governments, donors and NGOs are continuously asked to report on progress. Development actors use different methods to measure impact and sustainability, upon which discussions about further investments take place. The most common is "coverage", but there are also others such as the "sustainability snapshot" and the "equity distribution indicator" (Sugden 2003). However, none of these have a time element, and even the World Bank, that has strengthened their definition of sustainability, has failed to introduce a measurable indicator other than coverage (World Bank Group 2008). Coverage is calculated in many different ways, but is normally expressed as a percentage of the total population that has access to drinking water. In addition, governments and international agencies such as the UN set global and local coverage targets to guide the development process. The ultimate goal is to reach 100% coverage, something that produces the incentive to annually report an increase in coverage. There are many critics of the calculation of coverage, reliability and actuality of data and adverse effects of the "coverage-mania" on the ground. This paper argues that it is wrong to use coverage as the main indicator of development in the first place, since it provokes counterproductive incentives and gives a wrong picture of the long-term results and impacts of an investment.

The operation and maintenance ghost

As a result of the incentives produced by the interest in increasing coverage, the main focus of donor agencies, governments and NGOs is the development of new infrastructure and extension of water supply to new populations. At the same time, NGOs and governments report on a high number of breakdowns of existing water infrastructure, and the inability of current institutional and communal structures to operate and maintain them. This short-term vision of implementing agencies and donors is a paradox at a time where sustainability is the biggest word. The problem of dysfunctional water points is not well documented and the real figures are probably much higher than the official numbers. Studies show that the 90% of the handpumps set up in Africa break down within the third year of operation (WATSAN Consult undated). It is also estimated that more than 35% of all rural water supplies in sub-Saharan Africa are not functioning

(Baumann 2005). The combination of the focus on coverage increase and the failure to collect data about dysfunctional systems give a distorted picture of the impact of developing new infrastructure for water supply, and leads to an inefficient and irrational allocation of resources and efforts.

There are many examples of the preference of donors (and hence receiving governments) for an implement-handover-exit strategy, adding up coverage numbers without taking into account the current status of their functionality. In a country like Uganda that is quite advanced in terms of reforming its water and sanitation sector, only 8% of the conditional governmental grant for water allocated to each district is earmarked for operation and maintenance. 72% is allocated for the development of new sources, and the rest is for monitoring and software activities (MWLE 2000). The conditional grants in Uganda are allocated based on coverage figures from the previous year. This means in practice that a district with high coverage and many water systems to operate and maintain, will receive a relatively small conditional grant, something that makes the budget for operation and maintenance even smaller. For every NGO or donor that "gives" a water system to the district, its small budget is stretched even further and the system becomes a burden for the administration. Frequent breakdowns and long downtimes are inevitable.

The myth of the self-sustaining community

In addition to the inappropriate allocation of scarce government resources, the lack of focus on operation and maintenance costs has been maintained by the myth that was introduced in the 1980s with the concept of community management. After a failed centralised approach, community management was implemented on large scale in the 1990s and still counts as the main management model for rural water supplies. This approach is built on cost recovery of operation and maintenance costs (and sometimes also capital costs) within the user community. The collected money from the community will be saved and used to pay for maintenance and repairs. This was an attractive approach for donors and NGOs, as it bypassed incapable and corrupt government structures (Lockwood 2004). At the same time, even if implemented carefully and followed up over a long time, the fewest communities are able to financially cover all operation and maintenance costs themselves (Carter 2002). After all, why should they? In the developed world, almost all water supplies are subsidised or benefit from economies of scale. Neither is available for remote rural communities in developing countries. Nevertheless, the quest for increased coverage has led to turning a blind eye on this fundamental problem of sustainability.

A consequence of the approach described above is that there is simply not enough money allocated for operation and maintenance since governments are pushed to prioritise new infrastructure and NGOs assume that the money for operation and maintenance will come from the local government or the community itself. Local governments need more money to support communities and carry out repairs and maintenance, and communities need financial support. Breakdowns and dysfunctional systems are often blamed on a weak enabling environment, wrong technology, wrong management model, bad implementation or absence of supply chains and remoteness of rural communities. However, if there was money allocated for operation and maintenance, all these obstacles could be overcome. If there was a flow of money from governments, donors and communities for operation and maintenance, institutions to take care of this would emerge. If people had enough money to buy spares, supply chains would be created (Oyo 2002). During a recent study looking at management models for rural water supplies in Uganda, the conclusion was that if there was no money for operation and maintenance, no system worked, independently of the management model or the type of support mechanism (Koestler 2008).

A bad investment

Why is it so hard to convince donors that money for operation and maintenance is important? This question becomes even more surprising when the economics of their investment is taken into account. Driven by the wish to increase coverage figures, donors have invested in an utterly inefficient way. By focusing on new infrastructure and neglecting operation and maintenance of existing systems, they are constantly undermining their goal of 100% coverage, because each year a certain amount of people lose access due to dysfunctional systems. This element is not taken into account because coverage is a static indicator, unfortunately often based on cumulative historical figures rather than updated facts. It simply expresses how many additional people that get access to water through the development of a new water system. However, it does not take into account the number of people that will get water every year in future from the new water system, if it is kept functional. It is therefore necessary to add a time-aspect to the coverage figure, and call the indicator water-person-years (WPY). This indicator tells us how many people get access to water from

year one and each year throughout the lifetime of the infrastructure, and makes it possible to express the impact of an investment in a cumulative way, over a period of time.

Thinking in water-person-years

The easiest way to explain this concept is to look at a simple example: an organisation has in total 300 units of money to spend on water supply, and the investment cost of each supply is 100 units for a village of 1000 people. To simplify, the 100 units include both hardware and software costs, where the relative distribution will depend on local settings. We also assume a constant population and that money today has the same value tomorrow. According to the approach used today, the main goal of the organisation will be a quick increase in coverage. It will therefore construct three water systems for 100 units each in 3 villages of 1000 people each. The total cost is 300 units. However, without any money reserved for follow up and operation and maintenance, each water system can be assumed to break down after a time of about 3 years. The total water-person-years this investment gives is therefore:

3 villages x 1000 people x 3 years = 9000 WPY

If the organisation instead focused on one village and constructed one water system for 100 units, and set aside 10% of the investment cost (10 units) for operation and maintenance each year for the next 20 years, the result looks like this:

1 village x 1000 people x 20 years = 20 000 WPY

The example shows that the impact of the investment is more than doubled (20 000 WPY instead of 9000 WPY) if enough money is allocated for operation and maintenance.

What are the implications of the calculations above? The goal of donors and governments should be to supply as many people as possible with water over time with a certain amount of money. This means simply making a good investment and allocating resources in an efficient way. According to the result of the small exercise above, donors should, therefore, value the fact that a water system has been maintained and run for an additional year as much as the construction of a new system. Donors and governments should allow for money spent on operation and maintenance, even if this is less prestigious than commissioning new infrastructure project and requires long-term thinking and commitment. Thinking in water-person-years, a water system maintained should even be more valuable than a new system constructed. This is because for each additional year that the infrastructure lasts, the capital cost per delivered WPY diminishes, hence increasing the effectiveness of the initial investment. In economic terms, therefore, focus should shift from new people supplied to people still supplied from previous investments. Only by allocating resources in this way they will have the highest potential impact and the projects will be truly sustainable.

A paradigm shift

What would this mean in practice? If donors and NGOs had to set aside 10% of investment costs for operation and maintenance each year for the next 20 years, this would mean a profound change in the whole development aid industry. In principal, no project should be allowed to be implemented or “given” to local authorities, unless this commitment was made. However, in reality this would be difficult to enforce for a developing country, enthusiastically accepting each possible donation. It would also be extremely difficult for NGOs and donors to comply with. Donors and NGOs, that normally like short projects and avoid commitment, would be extremely hard to persuade to accept commitments from 10 to 20 years of operation and maintenance costs for each water project. However, by increasing the requirements for implementing agencies and forcing them to make long-term commitments, they would also become more stable, concentrating on a small area and designing projects with a long-term perspective. This leads to a smaller number of NGOs active in each geographical area, and the long-term commitment would increase the “entry-cost” for each NGO considerably. At the same time, communities would benefit in terms of less confusion in the NGO jungle, less broken promises and better and more adapted projects implemented by a locally specialised NGO.

These assumptions are of course playing with ideas that would be extremely hard to implement in practice. The message of this publication, however, is that it is necessary to move away from the current focus on today's water access coverage, not because the numbers are often wrong but because the indicator is based on a wrong assumption and leads to an inefficient allocation of resources. If donor agencies would ask governments and NGOs to report on yearly implemented projected WPY, the sustainability of water supply projects in developing countries would increase drastically, simply as a result of an increased amount of money available for operation and maintenance. If the selection of new projects was based on WPY and not only on increased coverage, better and more sustainable projects would be designed, and it would also become easier to receive funding to rehabilitate or extend existing infrastructure. The effect of reporting in projected WPY is however linked to the timeframes in development planning. If WPY was considered with a three-year perspective for the durability of the infrastructure, today's focus on new construction would be justifiable. However, international development should be based on a vision that investments today should last for the next generations to come. With this long-term perspective, WPY becomes the most reasonable way to measure impact, efficiency and sustainability.

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