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MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

Productive uses of domestic water: opportunity or threat?

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This paper argues that small-scale productive uses of water such as for garden irrigation, keeping livestock, post-harvest crop processing and other micro-enterprises should receive better consideration in the planning of domestic water supply systems. Currently opportunities are being lost to maximize the impacts on poverty alleviation of improvements in water supply, and sustainability is undermined by failing to address the productive needs of users. An agenda for possible policy change, implementation actions and further research is included based upon the outcomes of an earlier international symposium.

Introduction

In addition to basic domestic needs, a strong demand is often expressed by households for water for small-scale productive uses such as garden irrigation, raising small numbers of livestock, post-harvest crop processing and micro-enterprises like small restaurants. These productive uses of water can generate income helping to meet the costs of water supply, contribute to food security, and help poor people, especially women, strengthen their livelihoods.

However, domestic water supply services are generally not planned to take account of small-scale productive uses or system managers prohibit such practices. At best productive uses are tolerated rather than planned. A sector-based approach prevails where planners are not open to more flexible approaches to water development. This limits the beneficial impacts of water supply systems.

In this paper we review some of the evidence for re-thinking the role of productive uses of water, looking mainly from the perspective of the domestic water sector. Based upon the activities of an international network, the PRODWAT thematic group (www.prodwat.watsan.net) signposts are then flagged for possible policy change, implementation actions and further research on this topic.

The role of productive uses of domestic water in livelihoods

A number of empirical studies and case studies have recently highlighted the wider non-health related benefits of domestic water supplies:

- A study in the Bushbuckridge area, South Africa (Perez de Mendiguren, 2001) showed high-levels of water use for economic activities in villages, with both poor and good water supplies, ranging from 23 lpcd to 40 lpcd above the amount used for basic needs (21-22 lpcd). Economic returns from these water users were relatively high, ranging from 1-2 €/m^3 for vegetable gardens and fruit trees (the most common use of 'extra' water) to 120-160 €/m^3 for beer brewing and ice block making. In comparison the estimated additional cost of a system based upon roof tanks rather than yard tanks to supply sufficient water was 0.11 €/m^3 (Moriarty and Butterworth, 2003).

- At the household level, a significant proportion (roughly half) of so-called 'domestic' water supplied in Tarata and Tiquipaya, near Cochabamba in central Bolivia, through piped systems was used by families for productive activities: including irrigation of huertas (gardens), watering livestock or other enterprises (Bustamante et al., 2004a; Duran et al., 2004).

Risks associated with productive uses

A numbers of case studies have also recently highlighted negative issues associated with the productive uses of domestic water.

- In the Western Highveld area to the north east of Pretoria, South Africa, water shortages faced by 1.1 million people in peri-urban areas during the summer were linked by McKenzie et al (2003) to excessive water use and losses. This included irrigation for gardens and small-scale agriculture. The high water use in certain areas resulting in shortages in other areas which in turn had to be supplied by tankers. In effect gardening was costing taxpayers 20 times the price of a normal water supply to source tanker water.

- Hope et al. (2003) in Limpopo Province, South Africa,

found that all social cohorts undertake kitchen-garden farming as a significant livelihood activity. Over 70% of households consumed all crops grown indicating the importance of this activity for food security. However, access to domestic water was disproportionately skewed in favour of the male-headed, income wealthier households, and the number of kitchen-garden crops grown was significantly associated with private water access.

- In Tarata, a small town near Cochabamba, Bolivia, disputes came to a head in 2002 over the rights to use water for urban and peri-urban agriculture from a multiple purpose water supply system (Bustamante et al., 2004b). A dam was constructed to provide water for a large irrigation scheme and to meet the basic needs of domestic users in the town (5% of the reservoir yield was allocated for urban water supply). But the domestic allocation was not used for four years due to the poor water quality and high costs of treatment. The urban community later utilised this water for irrigation of huertas, leading to violent conflicts with farmers from the irrigation scheme who were determined to protect their irrigation water rights. They did not believe that the urban community had the right to switch this 'domestic' water allocation to small-scale productive uses.

- On Santiago Island in Cape Verde, Fonseca (2005) describes how the financial sustainability of water supply systems of municipal Autonomous Water and Sanitation Companies (SAAS) is undermined by productive uses (larger field-scale irrigation in this case). Some wellfields here are used to supply water for domestic consumption as well as for irrigated agriculture around the towns, and the water companies manage supply for both users. But the water companies do not recover enough water fees to cover costs and currently they face serious problems of financial sustainability. The main reason for this situation is a subsidised tariff for irrigation water, which is much lower than the production costs that the water companies have to bear (Fonseca, 2005)

In most of these cases it seems more reasonable to argue that these problems are not related to productive uses per se, but rather the fact that the productive uses were unplanned or badly planned. It may well have been possible to meet some of the demands for productive uses around Pretoria through alternatives like rooftop rainwater harvesting or community gardens utilising groundwater sources. One of the lessons for productive use of household supplies is to use efficient forms of irrigation (e.g. trickle methods). Similarly in Limpopo, perhaps water supply systems could have been designed with a stronger focus on equity. Flow control or metering may be required in some situations to prevent individuals taking excessive amounts of water. In Tarata, recognition of peri-urban/urban agriculture might have been envisaged when the dam was constructed and the planned increased availability of water for the town was being considered. In Cape Verde, tariffs might have been better designed to improve equity and avoid the poor cross-subsiding irrigators.

An agenda for research and implementation

In January 2003 experiences and ideas on how small-scale productive uses of water at the household level could be better addressed were shared at an international symposium in Johannesburg[1]. A multi-disciplinary group of practitioners, researchers, and policy-makers from 14 countries across Africa, Asia, South and North America, and Europe published the statement in Box 1 summarising the most important findings, beliefs, and recommendations of the participants (Anon., 2003).

Over two years later it is interesting to reflect upon some changes in global policy dialogue on WASH and moves towards implementation of some of these ideas. In South Africa, the Department of Water Affairs and Forestry who hosted the symposium have incorporated ideas relating to small-scale productive uses and livelihoods within both water services and water resources policy. The Water Services Strategic Framework (DWAF, 2003) said that

"water and sanitation programmes will be designed to support sustainable livelihoods and local economic development. The provision of water supply and sanitation services has significant potential to alleviate poverty through the creation of jobs, use of local resources, improvement of nutrition and health, development of skills, and provision of a long-term livelihood for many households."

And the recent National Water Resource Strategy (DWAF, 2004) echoed this message and its role in development

"Similarly, whilst prioritising allocations of water for emerging farmers and small grower forestry schemes, and revitalising defunct irrigation schemes has the potential to provide livelihoods for many people in rural areas, these do not address the needs of the large numbers of people who require water for small-scale activities such as, for instance, brick making, rearing poultry and growing produce for local sale. The quantities of water required are relatively small - research in small villages indicates that livelihoods can be significantly enhanced by the availability of 50 to 100 litres per household day."

The UN Millennium Project (2005) noted that

"water is also a factor of production in industry and many other types of economic activity, including both large-scale activities and small, often home-based activities where the poor are themselves entrepreneurs, such as food processing for vending in markets. Access to key factors of production, including water, is critical to the viability of activities that can act as a ladder out of poverty."

Conclusions and recommendations

People draw multiple benefits from access to domestic

water supplies – it is the combination of these benefits that add up to an appreciable impact on livelihoods and poverty. Artificial distinctions between domestic, irrigation and other water use should be abandoned in favour of the concept of a 'household water supply' which is sufficient for a range of basic needs (drinking, washing, cooking, sanitation) and household-scale productive activities that match the livelihoods of people. People want 'multiple use services'. These can be achieved by modifying the implementation of traditional sector based approaches.

Narrow approaches to domestic water supply that neglect the potential of productive uses are an opportunity missed. Worse than that, because in practice people will use water for productive activities anyway, ignoring productive use leads to under-designed systems that fail through unplanned use. It is therefore much better to include small scale productive uses in initial system planning and design, potentially contributing to both sustainability and cost recovery in water supply.

Low and inflexible norms-based 'basic needs' can be a handicap – by setting targets too low they fail to provide for the very productive activities that could help people grow food, make money, and escape poverty. These uses should be considered basic or standard. Norms are required for proper planning, but they should be based on at least some productive use, and should in any case act as benchmarks and not upper limits. A norm of 50-200 lpcd depending on setting should be adequate to provide sufficient water for productive uses while not placing (in any but the most extreme emergency or drought situations) an unbearable strain on water resources or the environment.

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Note/s

1. All papers from the symposium can be downloaded at www.prodwat.watsan.net

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Box 1. Statement on poverty and productive uses of water at the household level from an international symposium held in Johannesburg, South Africa, 21-23 January 2003 (Anon., 2003)

1 Productive use of water at the household level by poor people reduces poverty

Sustainable livelihoods can be built on access to water that goes beyond current approaches to meeting both domestic needs (drinking, cooking, and washing) and irrigation needs. The water needs of the poor always extend beyond the domestic.

Productive uses of water at the household level include a range of small-scale activities that enable people to grow food, earn income and save expenditure: fruit and vegetable production, keeping livestock, brick making and building, and a wide range of informal micro-enterprises.

Without access to sufficient and reliable water for productive uses in and around the household, people are excluded from a range of options that would allow them to diversify and secure their sources of food and income. At the most basic level, poverty is a lack of opportunity. Access to productive water supplies provides opportunities.

We believe that productive uses of water in and around the household are the most socially and economically effective uses of water after 'traditional' domestic uses, and that providing water for these uses offers one of the most effective ways to use water to tackle poverty in its multiple-dimensions.

The provision of water services, that include water for productive uses, needs to be planned to ensure that benefits are inclusive or pro-poor. In planning, implementation and research it is important to hear and act upon the voices of the poor, women, and children, recognising that otherwise benefits may be captured by elites.

2 People require more than their domestic water needs to be productive

It is universally accepted that people should have access to a basic domestic water supply (often ranging between 25-50 litres per capita per day (lpcd)). We believe that poor people should also have access to water for productive uses. Total household water requirements for poor people including water for productive uses are likely to be in the range 50-200 lpcd.

These quantities can be realised by helping households secure access to water through a range of alternative approaches (such as roofwater and run-off harvesting, family wells, communal water points, piped water systems, municipal and household level wastewater reuse) and by investment in systems that are equitable and reach the maximum number of poor beneficiaries.

The better off living in cities around the world typically consume around 200 lpcd. We believe that finding ways to provide and manage the use of similar amounts of water in support of poor people's livelihoods is vital.

3 Productive use enhances the sustainability of water supply systems and services

In most cases the sustainability of domestic water supply systems can be increased by explicitly including productive water uses that provide the means and motivation for people to engage in the management of systems. These uses generate income that can be invested in system improvement and maintenance. Sustainability has been hard to achieve in water and sanitation: we believe that the lack of opportunities for productive water uses is central to this problem.

When people have demands for productive water that are not met, problems arise and ownership and participation are reduced. 'Illegal' connections to domestic piped water systems cause serious problems that could be anticipated and avoided by satisfying the demand for productive water, possibly from different sources. We believe the benefits will normally greatly exceed the incremental financial costs.

Many irrigation schemes provide multiple benefits. Meeting the needs for other uses of water (including domestic) through an integrated approach enhances the impact as well as performance of irrigation schemes and systems.

Productive use of wastewater provides opportunities for many urban and peri-urban farmers, but simultaneously places them, the consumers of their products, and the environment at risk. In accordance with the Hyderabad Declaration on Wastewater Use in Agriculture (2002), we believe that appropriate policies, strategies and interventions can mitigate the human health and environmental risks while contributing to poverty reduction. The safer use of wastewater in agriculture should be encouraged and supported, and addressed within an integrated policy framework.

4 People need local solutions and multiple sources for multiple uses

Peoples' water needs are typically met through multiple sources - from rainwater to wastewater to piped systems. Rarely do people rely on single sources. And single sources tend to be used for multiple purposes. A holistic approach that builds on this reality is required in planning and service delivery to meet peoples' needs for household water supplies.

Wherever possible and taking into consideration downstream users, household water needs should be provided from locally available water resources, drawing on local knowledge, and at the lowest possible cost to provide a reasonable level of service.

5 An integrated approach is essential to achieve significant impacts on poverty

Demand for water for multiple purposes at the household level has, until recently, been insufficiently recognised in the planning and allocation of water resources in river basins. We recommend a process in which planners, and in particular local-level and catchment planners, acknowledge and take into account these needs as a priority consideration. This will need to be based upon appropriate assessments of the resource base, possible trade-offs, and environmental sustainability, and within an appropriate framework for demand management.

People who use water productively at the household level are numerous, but a diffuse and poorly represented group. Special attention is required to ensure that the voices of household level users, especially women, are heard at the Integrated Water Resources Management (IWRM) table. We believe that the use and management of multiple sources at the community level lies at the heart of IWRM, and that water should be managed from bucket to basin.

Improving access to water will not, on its own, eradicate poverty. People need better access to markets and credit, and to overcome many other constraints to make best use of more water. Collaborative partnerships with education, health and enterprise-based programmes can overcome some of these multiple constraints. This calls for better coordination, communication, and cooperation between different government departments, civil society, NGOs and the private sector.