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Economic and gender benefits from domestic water supply

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MOST DOMESTIC WATER projects are only designed and managed to improve welfare and health. Yet in (semi) arid areas, where water is a serious development constraint, women may use water and time gains also for economic purposes. This project investigated the scope and value of such uses and the impact on gender relations in north Gujarat (India). The research used case studies and PRA methods with women focus groups and also interviewed men. This paper presents the results and discusses the implications for the design and management of rural water services in (semi)arid areas.

Women's water collection: a drain on time and energy

Every day, innumerable women still carry home the domestic water for the family. Especially in dry areas, this takes much time and energy and restricts the amounts of water used for drinking and hygiene. A typical woman in Makete, Tanzania, spent over four hours per day on transport tasks (Sieber, 1996). In Beira, Mozambique, women spent seven hours per day of which 3,6 hours on collecting water and fuelwood. In other parts of Africa, transport time ranged from 1 hour to 2,5 hours per adult per day (Barwell, 1996).

Time spent on water collection reduces the time left for welfare-increas-ing work and is a drain on house-hold labour resources (Kamminga, 1991). It may have severe negative impacts on productiv-ity, especially at peaktimes such as during harvesting (Jennings, 1992). Riverson et al. argue that "female labour availability in terms of quantity, season-ability, location, labour quality and incentives, is therefore the key to agricul-tural improvement" (1991: 82). When water is brought closer to the home, women have adjusted their work in various ways. They have collected more water for drinking and hygiene and have reduced help from children, although boys and girls may not be treated equally, or they have spent more time and energy on other domestic tasks (van Wijk, 1998).

Domestic water projects are generally designed with only such domestic uses in mind. Common objectives are improving welfare and health. This places domestic water projects firmly in the social or health sector and not in the sector of economic development. Yet if women's water collection was replaced by paid labour, it would have high economic costs (McPherson and Jackson, 1975). Green concludes "Economics has so far almost totally failed to incorporate any of the characteristics of time (1996: 217). Women themselves see domestic water services also as an opportunity for economic development. Especially where gains are substantial, women in poor families have preferred to use savings in time for economic purposes: "Poor women ..feel [that] time spent ... should contribute primarily to the family income" (van Wijk, 1998: 118).

Productive use of water and time gains: a comparative case study

To test the assumption that water projects are economically important, a study was carried out in Santalpur and Radhanpur blocks in Banaskantha district, Gujarat, India. Banaskantha district is arid and poor. The main sources of income are rain-fed agriculture and dairy production. One half of the people are cultivators and one quarter agricultural labourers. Only 39% are literate (the state average is 61%). This is particularly due to the low literacy of women: 23%, against 55% for men. In the two blocks, literacy is only 17%. The literacy rate of women is not known. The area has an improved domestic water supply, the Santalpur pipeline, to which a development programme for women was added. The programme helped women to organise and set up rural enterprises. Banaskantha DWCRA Mahila SEWA Association (BDMSA), a district-level organisation in the Self-Employed Women's Association (SEWA), provided training, market research, marketing, quality control, and micro-credit facilities. The water project and the start of the enterprise project were financed separately by the Dutch bilateral development cooperation.

The study was implemented together with field staff from SEWA and FPI. The Swedish International Development Cooperation Agency (Sida) provided financial support. Participants were women focus groups from eleven women's micro-enterprises in nine villages and in five control villages. In ten other villages, interviews with women enterprise leaders took place. According to the 1991 census, the villages had comparable socio-economic conditions. All enterprises (crafts, dairying, salt farming, gum collection, and tree and fruit plantations) needed time or time and water.

The study had economic and gender objectives. The overall aim was to see if and how domestic water projects may be adjusted to maximise benefits from productive uses of water and time. The specific objectives were to assess the relevance of an improved water supply for women's economic use of water and time; to identify the impact on gender relations in households and communities and to strengthen the capacities of the implementing organisa-

tions in the use of participatory methods. The study used participatory rural appraisal (PRA) methods to collect data on time use, gender, and enterprises. Secondary sources were the census data and the enterprise accounts. Women from the enterprises took part in the design of the tools, the analysis of the data and the discussion of the findings and conclusions. More details can be found in the final report (IRC et al., 2001).

Economic impacts

To get insight into women's time use, time/activity profiles for a typical enterprise and control village household was drawn up. They distinguished domestic, economic, personal and developmental activities. Water collection for reproductive and productive use was assessed separately. Based on this data and the enterprise accounts, the income that is forgone due to breakdowns of the piped water supply was calculated. The potential economic and social gains of an improved water supply were also estimated.

Even with the pipeline, water collection was still time-consuming. Women in both types of groups have a working day of 15 to 16 hours throughout the year. On average, they spent 3 hours of this time on fetching water. Daughters spent 83, sons 12, and husbands 15 minutes per day. This brought the total average time for water collection to almost 5 hours a day. This is still high in a situation where, on paper, all households have year-round access to piped water provided to reduce the drudgery of water collection.

Women provided income to the family in four ways: through agricultural work on the land of the household, through expenditure-saving activities, by hiring themselves out as daily wage labourers, and by doing micro-enterprise work. The work in the micro-enterprises, the crafts enterprises in particular, provided family income at crucial times: in the dry season when income from other sources is absent. During the monsoon and in summer, women from the micro-enterprises spent significantly more time on income generating work than women in the control villages. (Table 1). The findings stress the importance of the micro-enterprise activities, especially during lean periods such as the summer and droughts.

The quality of the water service had significant economic consequences. Breakdowns made that women members lost an average of Rs. 50 per woman per month in earnings. Actual losses varied with the profitability of the enterprise. Extrapolating the loss to all SEWA micro-enterprise members in the two blocks, the inadequate operation and maintenance of the water service constitutes a loss of Rs. 2 million for 40,000 women. Actual losses are higher because the income data included a period of extreme drought during which income from dairying, plantations, and agriculture was virtually non-existent. In addition to financial losses, each woman lost, on average, seven hours per month in summer for reproductive and/or personal activities. An improvement of the water supply to the extend that women spend one hour per day on collecting water would result in an improvement of the annual income with upper boundaries of between Rs.750 and Rs. 5520. Alternatively, each woman might gain between 45 and 152 eight-hour days annually for domestic, social and developmental activities.

Gender impacts

In all villages, gender relations had changed in favour of women. For possession of assets and participation in decision-making and community management activities, progress was significantly greater for the members of women enterprises. During a breakdown of the water supply in summer, they received significantly more help from husbands, sons, and daughters than the women in the control villages. These gender changes had, however, not extended to daughters. In both enterprise households and in households in the control villages, daughters gave most of the household help.

Can women decide how they spend their time? The study assessed three levels of control: women alone decide; they decide together with someone else in the household, and someone else decides. In both groups, 90% of the women had some control over their time use, either solely or together with another household member (husband, mother-in-law, etc.). Approximately 10% had no say, however. They are probably the unmarried and/or recently married young women who according to local customs still have a subordinated position in the household.

Table 1. Women's activity profiles in enterprise households and control villages (N=16 villages)

		Summer		Monsoon	
Type of Activity		Enterprise villages	Control villages	Enterprise villages	Control villages
Reproductive activities	Other Water collection	**4.3*** 2.8	**5.1*** 3.5	5.2 2.8	5 2.5
Total productive activities	Income generating Expenditure saving Productive water	**7.5*** 1.1 0.4	**5.4** 1.9 0	**3.4*** **3.6*** 0.3	**0.1*** **7.2*** 0
Total personal activities		7.5	8.2	8.6	9.8

Data indicated with * were significantly different at p£ 0.05

Table 2. Women's role in water management in enterprise and control villages

% of women that have influence on water management decisions on:	Enterprise			Control		
	Men	Women	Both	Men	Women	Both
Investment in traditional water sources	34	18	48	65	12	24
Use of water	1	94	5	0	97	3
Follow-up after piped water supply breakdown	48	21	31	88	3	9
Construction of traditional water sources	38	25	38	85	12	3
Upgrading of traditional water sources	42	27	31	77	3	21

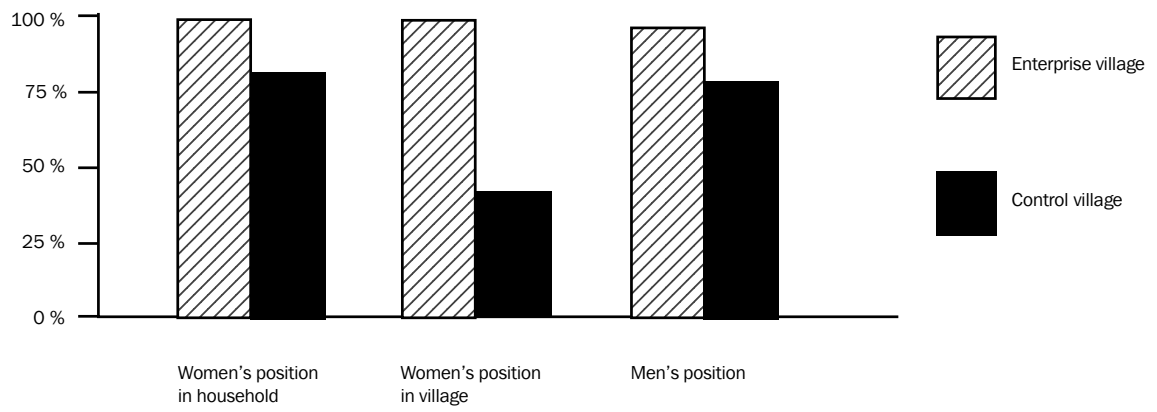
(N=77 women in enterprise villages and N=35 women in control villages)

On all accounts, participation in community-level affairs was higher for women from enterprise households than for women in control villages. This applied to attendance of public meetings in their own and other villages, speaking up at such meetings and being a women's leader in their own village and a cluster of villages. The tool did, however, not take into account whether in all villages meetings had taken place. It did also not differentiate between the nature of the meetings. Some general meetings are organised by the association of women's enterprises to discuss problems that concern the entire village and to initiate new, village-wide development programmes. In such meetings, the association ensures that women can speak up and that their opinion counts. Further development of the tool is thus required. Women in enterprise households were further more involved in the management of community water resources, with an exception of the use of water which is a women's issue only in both types of villages (Table 2). Apart from the use of water, all differences were significant. However, the women have no influence on the comprehensive piped water supply which is their preferred source of water and which is centrally maintained and managed.

For the analysis of who controls the income from women's work, a similar method of analysis has been followed as for time use. The three income categories used were: enterprise income, income from other sources such as agricultural labour and government relief work, and the overall household income. Women in the control villages had not started any independent entrepreneurial activities. Women's enterprise members had significantly more control over their own income and over the household income than the control group. However, some 9% women entrepreneurs had no say in the spending of the income that they had generated. This is probably the same group that does not have any control over their time. The women also evaluated how they spent their income. In all villages, domestic expenses came first. Women entrepreneurs spent significantly more on childcare and significantly less on personal items than the other women. They further spent significantly less on healthcare. Possibly this is a consequence of health care services by BDSMSA. In all villages women spent money on buying water. These were not regular payments, but occurred when they were short of this essential commodity.

In both types of villages, gender relations had changed. Fewer women ate alone (eating food that men and (male) children left over used to be common). More women went out alone and more children went to school. These changes seemed to be an outcome of overall social change. In the households of women entrepreneurs, the position of women was significantly better on going out alone, having savings and owning assets. Significantly worse situations regarding children's school attendance and agricultural decision-making had disappeared. Due to an error in the design of the tool, attending school was not split up for girls and boys. The findings on agricultural decision-making should be interpreted with caution, however, because during drought men often migrate in search of work and fodder for livestock and then women automatically make decisions. Because gender relations concern women and men, male team members interviewed the men. The responses were used for a content analysis. At first, they were surprised to be asked and had problems to discuss gender. However, they soon warmed to the issue and gave many and very specific reactions.

Only two were negative (women could visit places that men could not). In the control villages, the men mentioned a few more negative changes, but almost all were still positive. A small number of men referred to improvements in women's traditional gender roles such as better management of the house and greater cleanliness of the children. The majority, however, mentioned economic benefits for the family as a whole, a greater equality between the sexes (better communication between spouses, husbands helping



(N = 11 focus groups for entrepreneur households and N=5 for control villages)

Figure 1. Men's opinion on changes in gender relations

more), and women's empowerment. Interestingly, quite a number of male groups mentioned how the empowerment of poor women had also empowered them as poor men. As husbands they now got more respect in the village and were also undertaking new activities.

Conclusions and implications for domestic water supply projects

Combining effective income-generating projects for women with an improved, well functioning domestic water supply results in valuable extra income at critical times of the year and improved gender relations. Where no income generating projects for women have been added, women have not organised to undertake such projects on their own. Design and management of the water service have *not* been adjusted to the economic use of water and timesavings. Women had no say in planning and design of the service and have no influence on water distribution, service hours, and speed of repairs. As a result, valuable productive time and water use and income are lost and the service has not maximised its economic potential.

For new water projects in semi-arid areas, it is recommended that they are designed and operated for economic as well as domestic and health benefits. When water is scarce, as in Banaskantha, women should be involved in the distribution of the limited amounts of water over the system and in planning and managing the scheduling of the service and the maintenance and repair. Only then can water delivery be adjusted to women's domestic *and* economic needs and can they optimise economic uses and benefits. In the area itself, follow-up action research with the association of women's enterprises is required. This allows testing a better distribution of the available piped water and a better maintenance of the scheme and gives the opportunity to assess the impact of women's participation on the quality of the service. Only when the service meets the households' domestic *and* economic demands and helps enhance family income can it be expected that the users accept regular water payments as a normal procedure.

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