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Transforming time into money using water: A participatory study of economics and gender in rural India

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Abstract

When water supply improvements are coupled with opportunity to create income through micro-enterprises, time released from water collection is converted into income earned. This brings several benefits: reduced drudgery, higher household income, and, consequently, greater women's empowerment through changing gender relations within the household. This article documents the performance of one such scheme in Banaskantha District in the state of Gujarat in India, one of poorest districts in the state and the country. Here, due to the efforts of the Self-Employed Women's Association (SEWA), an Indian NGO, poor women are reaping the social and economic benefits of a government-run regional piped water supply scheme, a project funded by Dutch bilateral aid, focusing on women's development. If government policy-makers took the cue and formulated programmes and schemes that combined these two aspects, viz., actions that release time for rural women from daily chores (e.g., collecting water, fuel wood and fodder) and opportunities for sustainable micro-enterprises to convert time saved into income, this could become a reliable route out of rural poverty into gender-sensitive sustainable development.

Keywords: Gujarat, India; Water supply; Women's enterprises; Rural development; Gender relations; Income-generating activities; Poverty alleviation; Productive water use.

1. Introduction

Women are the main users of domestic water in rural areas all over the world. Improving domestic water supplies often reduces the time village women have to spend collecting water. If income-generating activities are provided alongside improvement in water supply, women can use the time saved to earn extra income for the family. Such extra earning can be an important succour in times of stress and also acts to empower women, which improves gender relations within families and in village societies at large.

While most policy-makers recognise that improving rural domestic water supply will reduce the drudgery and time taken by women to collect water from distant sources, few acknowledge that combining improved water provision with income generation can act powerfully to alleviate rural poverty and empower rural women. This is especially important in drought-prone, semi-arid areas in countries such as India, characterized by inadequate and erratic rainfall, declining groundwater tables, widespread poverty, ignorance and exploitation, especially of women.

In areas where farming is often insufficient to keep families above the poverty line, supplementary income generating activities are needed. Even such bleak social landscapes as that of Banaskantha in rural Gujarat (western India) can be transformed through women's empowerment, as illustrated in this article. This alternative route nevertheless requires conscious support and assistance. In this case, these were provided by the Self-Employed Women's Association (SEWA), a non-governmental organization (NGO) based in Ahmedabad, Gujarat.

In a situation where government programmes for poverty alleviation, education, health, hygiene and sanitation have not succeeded in raising poor women above the poverty line in times of crisis (e.g., drought, blight, or economic calamity) nor helped them to emerge from traditionally-defined gender roles, the possibilities offered by improving

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water supplies and simultaneously providing economic opportunities merit serious consideration.

2. Background

2.1. Banaskantha, the study area

Banaskantha is a poor district[1] in north-eastern Gujarat (Figure 1) with an arid climate. Agriculture and dairy production constitute the economic backbone of Banaskantha: more than half the population work in agriculture, the majority as labourers. Most farms are small, with less than 2 hectares of cultivatable land. Less than 5% of arable land in the district is irrigated, and most farms are completely dependent on rain, which falls during the monsoon, from June to September. The area is drought prone, with low overall rainfall (around 450 mm yearly average for the last 20 years) and frequent dry spells; sometimes monsoons fail completely (see Box 1). The drought of 1999, which was the severest in 50 years, hit Banaskantha particularly hard and agriculture and dairy husbandry were almost non-viable.

The natural water scarcity is exacerbated by excessive groundwater harvesting by richer farmers. Overdraught has caused groundwater tables to decline rapidly and salinity to increase.

Box 1. Rainfall and drought in Gujarat

Rainfall in the districts of northern Gujarat, particularly Banaskantha and Mehsana, is scant and highly variable. Many areas in Kutch, Saurashtra and northern Gujarat receive on average 400 mm of rainfall and at times none at all. Drought is a recurring phenomenon, normally striking every three to seven years. A severe drought may happen once in 7 to 10 years, and a very severe one once in 14 to 20 years. By 1996, there had been some 33 droughts since 1900, 12 of them after 1960. A total of 168 of Gujarat's 185 rivers course through drought-prone areas, most of them non-perennial and their flows account for less than 20% of total surface water use. Rain falls in a short spell of about 20 days between June and September. The steep slope of the short rivers down to the sea causes high run-off and floods during monsoons. Evaporation of water from open water bodies is also a major problem, with potential evaporation about 3000 mm/year.

Source: Barot (1996).

2.2. The Santalpur regional water supply scheme

Realising that village water supplies were inadequate to meet drinking water demand throughout the year, the Government of Gujarat in 1978 initiated the Santalpur Regional Water Supply Scheme, with the objective of providing 98 villages in Banaskantha with a centralized piped water supply. The project was funded under the Dutch bilateral development programme for India and implemented by the Gujarat State Water Supply and Sewerage Board (GWSSB) (see Box 2). Water was to be extracted through tube wells on the banks of the Banas River, pumped to overhead reservoirs and conveyed through pipes to the villages. Despite various problems and delays in construction, the project was eventually completed, though some time behind schedule.

In 1987, the Santalpur scheme was extended to provide drinking water to 48 additional villages and the town of Radhanpur.[3] Storage capacity was expanded, a radial well built at the source, pipelines reinforced, structural measures taken to tackle fluoride contamination, and village-level facilities constructed.

Although the Santalpur scheme had improved the water supply to target villages, studies in the early 1990s (Bhatt, 1991; SEWA, 1993) found village-level facilities in poor condition: taps were missing or damaged; drainage was poor; cisterns were leaking; valves were unprotected; and water often did not reach tail-end villages for a variety of reasons, including leakage and illegal tapping. Also, local institutional mechanisms to maintain and run the schemes were not functioning effectively: none of the 60 *pani panchayats*[4] were functioning. Further, traditional water sources had been neglected or had gone dry due to the increased and uncontrolled withdrawals of groundwater for irrigation by the richer farmers. The upshot was poor water supply, particularly in tail-end villages and during the summer; women had to walk further, thus spending more time, to fetch the family's drinking water — just as they used to before the scheme was installed (Shirihatti, 1990). In fact, when monsoon rains are poor, entire communities may migrate in search of work and fodder, rather than survive on the employment offered by the government's drought-relief programmes (mainly earthwork, and often at considerable distances from the villages).

[1] The district of Banaskantha has recently been split into two. This research was carried out in the newly created district of Patan, but for consistency's sake the old name of Banaskantha has been retained here.

[2] India's states are divided into districts (*zillas*) administered by locally elected councils (*zilla parishads*). Villages within a district are governed by *gram panchayats*, also locally elected. Since 1994, a third of the members of these councils must be women and 15% of the members must come from scheduled castes or tribes.

[3] Through the Gujarat Water Supply II Santalpur Extension.

[4] *Pani panchayats* are village water boards, consisting of two male villagers and a local functionary of the GWSSB, instituted to manage and maintain village level drinking water facilities.

Figure 1. Patan District (earlier part of Banaskantha) in Gujarat, India

Box 2. Domestic water supply in Gujarat

Responsibility for domestic water supply to Gujarat's 18,275 rural communities is shared between the local government with its elected councils (*gram panchayats* at the village level and *zila panchayats* at the district level) and the state government.[2] Until 1980, the Department of Health and Family Welfare was in charge of domestic water supply. In that year, the state created the Gujarat Water Supply and Sewerage Board (GWSSB) as a semi-autonomous body managed by a government-appointed director and responsible for the design, construction and management of large piped-water supply systems. Small piped water systems, which serve a single village or town (or a limited number of towns or villages), are built either by the *gram panchayats* or the GWSSB, but are operated, maintained and managed by the local *gram panchayat*. But even if centrally-managed systems were slightly better operated and more reliable than decentralized services, both types of systems have problems at the local level: economically and politically powerful *patedars* or *patels*, a high-caste group, dominate access to these services. The poor, especially poor women and girls, are most seriously affected by irregular service, since better-off families often have private boreholes, or servants and tractors to collect water from alternative sources (Streefkerk, 1986).

2.3. SEWA in Banaskantha: Women, water and work

In 1987, SEWA had been commissioned to establish income-generating schemes for women in areas covered by the Santalpur extension, following an evaluation of the Santalpur Rural Water Supply Scheme, which had pointed out that the scheme had not succeeded in initiating economic development for the poor, as intended in the original project set-up. Following SEWA's main strategy (see Box 3), activities in Banaskantha started with forming women's groups, with funds from the Government of India under the Development of Women and Children in Rural Areas (DWCRA) programme, targeted at poor rural women. The DWCRA scheme gives loans to groups of rural women to start their own income-generating activities, such as crafts, nurseries and plantations, salt farming, gum collection and dairying. Once the women are organized into groups, SEWA discusses the possibilities of micro-enterprises with each group and, if desired, provides basic training, as well as marketing and quality control. SEWA's involvement thus combines the advantages of local micro-scale enterprises with those of economies of scale. The five SEWA supported micro-enterprises in the villages covered by the study are given in Table 1.

Box 3. The Self-Employed Women's Association (SEWA)

SEWA, as the name implies, is an organization of poor, self-employed women who earn a living through their own labour or small businesses. SEWA was registered as a trade union in 1972 and currently has almost 275,000 women members in Gujarat alone. From 1988 onwards, SEWA began to assist self-employed women of similar background to organize themselves into income-generating groups and co-operatives. SEWA's goal is to organize women workers to achieve full employment and self-reliance, including work security, income security, food security and social security. Among SEWA's women members, 35% are self-employed working at home; 59% labourers or in-service workers; and 7% vendors. SEWA provides opportunities to women in poor households to use their existing resources and skills to develop their own micro-enterprise groups. Four specific strategies are used in combination:

(1) *Organizing poor women*, since individually, poor women have no voice;
(2) *Building new skills and capacities* so that women can become owners and managers rather than simple producers and labourers;
(3) *Encouraging capital formation* at the household, group and community levels with the income earned; and
(4) *Increasing social security* to enhance the well-being and productivity of women and to reduce the impacts of sickness or sudden crisis on fragile household economies.

On gender, SEWA believes that a poor woman's primary need is to become economically independent. However, given traditions and customs that restrict women's opportunities to learn and earn, poor rural women need assistance to organize themselves, change their self-concept, and take their own development in hand. SEWA's anti-poverty approach is based on what women themselves (as opposed to governments) ask for and decide upon, and its women's empowerment approach strives to ensure that women have the opportunity to earn, and to benefit from their earnings.

Source: SEWA (1999).

By the year 2000, 62 DWCRA groups and 160 savings-and-credit groups had been established. Between 1995 and 1997, SEWA gradually handed over control to the Banaskantha DWCRA Mahila SEWA Association (BDMSA), a local organization of representatives from the DWCRA groups and SEWA.

3. The study

The present study, carried out from June 1999 to April 2000[5], found that, with the type of micro-enterprises sponsored by SEWA, significant monetary and non-monetary benefits accrue to poor women if the time spent on water collection can be shortened. This study also found that it was an advantage for women to be organized into groups and work together. The resulting economic benefits significantly empowered the women, as well as improved gender relations, both generally and with regard to decision-making within households.

3.1. Objectives

The long-term objective of this study is to see how domestic water supply and women's enterprise projects in semi-arid or arid areas may need to be adjusted to maximize economic benefits, especially the productive use of water and time. The short-term objectives were to:

(i) assess the relevance of an accessible and reliable water supply for the productive uses of time and water by women in arid or semi-arid areas;
(ii) assess the impacts of women's income-generating activities on gender relations within the household and in the community at large; and
(iii) apply participatory learning tools and strengthen the capacity for participatory research of the implementing organizations, including the women's enterprises themselves.

3.2. Methods

Two villages were identified for each of the five types of micro-enterprise covered by the study, viz., handicrafts, plantations, gum production, dairying and salt production, totaling 10 'SEWA' villages. In addition, five other villages were selected for control purposes, using the criteria of roughly similar stages of development, according to data from the 1991 census and local information. The purpose of the control villages was to compare women's economic and gender situations to see whether SEWA's interventions had made a signi-ficant difference. Within each SEWA village, focused group discussions were held with the 10–15 member microenterprise groups, and semi-structured inter-

[5] The study was undertaken jointly by the Foundation for Public Interest (FPI), the Self-Employed Women's Association (SEWA) (both NGOs in India), and the IRC International Water and Sanitation Centre in the Netherlands, with Joep Verhagen, MSc. and Dr A.J. James, with financial support from the Swedish International Development Agency (SIDA). Representatives of the women's enterprises also participated in designing the research tools, analyzing the collected data, and discussing the findings and conclusions of the study.

Table 1. Details of the five village micro-enterprises studied in Banaskantha

Enterprise (product)	Characteristics of the enterprise	Nature of SEWA support	Villages Studied
Handicrafts (Patchwork and embroidery)	Traditional skill and technology, water needed for cleanliness in production (for quality control). Women spend 5 hours a day during summer months and 4 hours a day at other times of the year.	Spearhead teams of experienced crafts workers organize women into groups, build capacity, do quality control, develop products and take care of centralized purchase of raw material and marketing of finished products.	Par, Dhokawada, Madhutra[a]
Gum production	Traditional activity in the area. Best quality gum collected from locally available trees between October and November, sold by licence to the Gujarat State Forest Development Corporation (GSFDC). Women spend around 5 hours a day on gum collection.	Spearhead teams organize women into groups and provide management and accounting training. BDMSA[b] negotiates for gum licences for groups with the GSFDC, and purchases and markets the gum from groups.	Parsund, Patanka
Plantations (Saplings, fruits, fodder and vegetables)	Land usually leased from government annually; needs a reliable source of water nearby. Women spend around 5 hours a day, throughout the year.	Spearhead teams organize the women into groups, start the nursery and plantation, provide training and purchase nursery output.	Zanzarsar, Zandala
Dairy (Milk)	Sold through local village-level dairy co-operative to the district-wide Banas Dairy. Water is essential for bathing animals and cleaning of milk vessels, besides for animals to drink (less water reduces milk yield). Women spend 4-5 hours a day throughout the year.	Spearhead teams organise women into dairy co-operatives at the village level, and train women on technical issues, including quality control. SEWA also provides subsidized fodder during droughts.	Moti Pipli, Garamdi
Salt production	Traditional activity in the area; salt workers live in huts in the desert, sometimes for months at a stretch. Salt water from (bore) wells is evaporated in a complex system of saltpans, using traditional techniques known only to the men. Capital requirements are now high (bore well, diesel pump, wages and transportation of salt).	Spearhead teams form groups and provide technical, managerial and accounting training. BDMSA negotiates salt sales with government agencies, provides credit for initial investment and working capital (through the DWCRA programme), and markets the salt for all groups together.	Madhutra,[a] Ranmalpura

Note: [a] Madhutra has both handicrafts and salt making enterprises.
[b] The Banaskantha DWACKRA Mahila SEWA Association.

views were held with group leaders. More detailed discussions were held with seven women from each enterprise group and seven women from each control village, using participatory rural appraisal (PRA) tools.[6] Existing PRA tools were used to collect information on time/activity profiles, women's degree of control over time and income, and on typical household economic profiles, while new participatory tools, designed jointly by the research team and women from enterprise groups, were used to discuss enterprise-related issues, such as the cost of fodder, number of cows, distance to gum trees, and additional income from the sale of fodder.[7] In addition, semi-structured interviews were held with the husbands of enterprise group members and other men in the village. The research team analysed the nature and frequency of responses through content analysis of the statements in Gujarati and after translation into English, comparing the two for consistency. Information was collected in two rounds, once during the summer (March–May) and once during the monsoon (August–September).

4. Valuing access to domestic water supply

If water supply from a public source is inadequate, irregular or unpredictable, users generally have to spend more time on their water-collecting chore, as they have to locate and use an alternative source. This extra time that households — and women in particular — have to spend collecting water, is taken away from other activities. It thus has a cost, albeit a cost that is not easily measured in terms of money. Also, irregular water supply — particularly breakdowns — may oblige village women to buy water, which is a monetary cost. When water supply service is improved, users not only save money since they do not have to buy water, and/or time, since fetching water is quicker — but the time saved can be used for other activities: either productive (economic), domestic (such as looking after children, cooking, cleaning, etc.), personal (sleeping, socializing, etc.), or development and management related (e.g., attending

[6] These focus groups of seven women each were purposely chosen (in consultation with group leaders in the case of micro-enterprise groups), giving a total of 77 women from 11 micro-enterprise groups in the 10 SEWA villages, and 35 women chosen from the control villages. All data reported in this article are based on averages calculated from the responses of these two groups of women.
[7] The design and use of new participatory tools (especially to collect quantitative information) enhanced the capacity of the research team and the women from the various micro-enterprise groups.

meetings, carrying out group work, participating in community activities, etc.).

Even though the water situation in the 15 villages covered by the Santalpur scheme needs to be improved further, the value of an improved water supply could be measured using the two approaches described above, with respect to:

(1) *costs of breakdowns in water supply*, i.e., the time and/or money users spend to secure water during a breakdown of the regular piped supply; and
(2) *benefits of improved water supply*, i.e., the time and money that users would save/gain if they needed only 1 hr/day, throughout the year, to collect water.

Using participatory tools, information was gathered from the 16 focus groups (of seven women each) on the time spent in the summer and non-summer months[8] (of 2001) on the following five activities:

- collection of water for domestic and productive purposes (e.g., for livestock and gardening);
- domestic activities, such as childcare, cooking, cleaning, household work;
- economic activities:
  - Income-generating activities, such as enterprise work or daily-wage labour; or
  - Expenditure-saving activities, such as livestock rearing, garment making, agricultural work on own land, etc.;[9]
- personal activities, such as social activities, sleep, etc.; and
- development and management activities, such as training, attending meetings, managing the enterprise, etc.

While time-spent data for the first four types of activities were collected using a 24-hour 'clock', data on management activities were collected on the basis of a three-month period. This information for SEWA villages and control villages is given in Table 2.

A point to note from Table 2 is that, despite the improved situation after the installation of the Santalpur scheme, water collection is still time consuming. In both SEWA and control villages, women spend an average of 3 hours/day fetching water, out of a working day, throughout the year, of 15–16 hours. The family as a whole spends almost 5 hours a day on fetching water (daughters 83 minutes, sons 12 minutes, and husbands 15 minutes). This is very high, especially in villages where, at least on paper, all households have year-round access to piped domestic water supply.

[8] There are three summer months (March to May) and nine non-summer months (June to February), including the monsoon months of June to September.

[9] Simply put, income-generating activities bring in income either in the form of cash or kind (e.g., for some types of agricultural work), while expenditure-saving activities help the household to avoid making such payments (for goods and/or services used by the household).

5. Cost of water supply breakdowns

In the summer months, more than at other times of year, there are days when there is no water either in public or private taps. Village women must then either walk to distant sources or buy water for their household needs. Women working in micro-enterprises often prefer to pay someone to collect water or to buy it, so that they can continue working. Table 3 details the calculation of the money and time lost from breakdowns in the water supply during summer months.[10]

The number of days without piped water in summer was calculated on the basis of the reported frequency of breakdowns. The extra hours, on average, that each woman had to spend to get water during those days and the activities from which this time was taken are calculated from the time/activity profiles. The extra time taken from economic activities is expressed in monetary terms by multiplying the number of hours by the prevailing wage rate of Rs.40 per day per woman (which is Rs. 5 per hour, assuming an 8 hour day). Adding this amount to the (average) amount spent per day to buy water gives the total cost of the breakdown in monetary terms. The extra time spent on water collection that was taken away from non-economic activities was calculated separately. The total cost is calculated from the estimates of monetary and non-monetary costs per day without water, multiplied by the total number of breakdown days (in summer). Conversely, this is also a measure of the potential benefits to be reaped from improving the water supply situation so that there are fewer or no breakdowns.

The main findings on the cost of breakdowns in water supply that emerged are the following:

- each of the women in the group working on micro-enterprises lost an average of Rs. 162 (in lost earnings or costs incurred) on account of breakdowns in the regular water supply during the three summer months (an average of Rs. 50 per woman per month).
- also, in each of the three summer months, each woman lost an average of seven hours of time that she could have spent on other activities, including sleep, looking after her children, personal work, socialization, etc.

Extrapolating these estimates to the 40,000 SEWA members in the area, all of whom face breakdowns in water supply, especially during the three summer months but some for longer periods, implies a loss of Rs. 2 million (more than US$ 40,000) in potential earnings/extra expenditure due to breakdowns in the existing service (in summer alone).

[10] Since the situation is worst in summer months, a similar calculation was not carried out for non-summer months.

Table 2. Time spent on different activities by women in SEWA and control villages

Type of activity		Average number of hours spent by women[a]			
		During summer (March–May)		During non-summer (June–February)	
		SEWA villages	Control villages	SEWA villages	Control villages
Productive activities[b]	Income-generating[c]	7.9*[d]	5.4*	3.7*	0.1*
	Expenditure saving	1.1	1.9	3.6*	7.2*
Domestic activities	Water collection	2.8	3.5	2.8	2.5
	Other (including development & management[e])	4.3*	5.1*	5.2	5.0
Personal Activities		7.5	8.2	8.6	9.8
Total[f]		23.6	24.1	23.9	24.6

Notes:
* Row-wise pairs of data.
[a] The data are averages from 77 respondents from SEWA villages and 35 from control villages (see footnote 6).
[b] Definitions of income-generating and expenditure-saving activities are given in Section 4 and footnote 9.
[c] The average time spent on income-generating activities in SEWA villages includes time spent on water-using micro-enterprises like dairying and plantations (0.4 hours per day in summer and 0.3 hours per day in non-summer).
[d] Pairs of data (in summer or non-summer and across SEWA and control villages) indicated with an asterisk (*) can be said with 95% confidence (statistically) to be different across SEWA villages and control villages (using a small sample t-test, assuming equal variance, and testing for different means). The difference, in other words, is not a statistical illusion that may become apparent when a large enough sample is considered. Thus, for example, the average number of hours spent on income-generating activities in summer in SEWA and control villages are the averages from two different (statistical) distributions of time spent. However, the difference between time spent in summer on water collection in SEWA and control villages (2.8 hours and 3.5 hours) is not a real difference, statistically speaking.
[e] The average time spent on development and management activities by group members is 2.0 hours in summer months and 0.9 hours in non-summer months.
[f] Totals do not always add up to 24 hours because respondents can only give average figures for time spent on each activity per day, since the reference period spans several months.

6. Benefits from improvements in water supply service

The benefits of improved water supply were calculated from the hypothetical situation if service were improved to the point where each woman needed to spend only one hour a day collecting water. The extra time thus available could be used for domestic activities, leisure and other personal activities or on economic activities. If a woman has the freedom to allocate such newly-created free time as she wishes, and if additional economic opportunities are available, she can transform the time released into money. Financial returns of time invested in each of the micro-enterprises were calculated per hour using data from the enterprises financial records, while focus group discussions provided information on the hourly returns to alternative employment available to village women. Figure 2 gives the potential income that a woman could earn in a year from a particular micro-enterprise, by investing the time released from water collection. Note that the micro-enterprises where water is a basic input (e.g., plantations or salt making) do not necessarily have a higher return than those that use water only indirectly (e.g., handicrafts and gum collection).[11]

Calculations show that if the time a woman spends collecting water could be limited to only 1 hour/day, she could earn an extra Rs. 750 to Rs. 5,500 a year, depending on the enterprise. Extrapolated to the 40,000 SEWA women in Banaskantha as a whole, the total annual benefits could be as high as Rs. 3 million a year at even the lower figure of Rs. 750/woman/year.

However, it is not just the amount earned but the significance of the earnings that is important in this context. Discussions in the field revealed that women feel that their income contributes significantly to the welfare of their family. Although women contribute to the economic welfare of their household through income-earning activities and expenditure-saving activities (see Table 2 and footnote 9), they feel that the income from micro-enterprises (particularly handicrafts) is special since it is earned and used during the dry season and at times of special hardship, when no other source of employment or income is available. Micro-enterprise activity is thus a particularly valuable source of income for poor families and a means for women to meet the economic needs of the household during crises.

7. Changes in gender relations

Although gender relations have changed in favour of women in all villages during the last ten years, there are differences

[11] In handicrafts, water is used mostly to wash hands so that the craftwork is not soiled and quality affected.

Table 3. Social and economic costs to women of water supply breakdown in SEWA and control villages[a]

Village	Number of days without water supply in summer	Extra hours spent to collect water (per day)	Consequently less hours spent on		Value of forgone income	Water purchase cost	Cost per woman of water supply breakdowns over summer season	
			Productive activity	Personal/domestic activity	Potential income lost due to breakdowns in summer (@ Rs. 40 per 8 hr day)	Average spent by each woman in SEWA group to buy water in order to continue micro-enterprise work (Rs.)	Economic cost (Water purchase cost + value of forgone income)	Social cost (Nº of 8-hour days lost of personal/ domestic time)
SEWA villages								
1. Par	13	0.0				186	186	0
2. Dhokawada	7	0.5	–0.5		16	5	21	0
3. Madhutra	46	2.0		–2.0		121	121	11
4. Parsund	3	4.5	–4.5		73		73	0
5. Patanka	13	2.0		–2.0			0	3
6. Zanzarsar	3	2.0		–2.0			0	1
7. Zandala	13	0.0					0	0
8. Moti Pipli	7	2.5		–2.5			0	2
9. Garamdi	46	3.0	–3.0		683	300	983	0
10. Ranmalpura	46	2.5	–1.0	–1.5	228	4	232	
Control villages								
1. Abiyana	2	2.0		–2.0			0	1
2. Dhrandva	13	2.0	–2.0		130		130	0
3. Kamalpura	26	2.5		–2.5			0	8
4. Sherpura	0	1.0		–1.0			0	0
5. Manpura	7	0.0					0	0
Average breakdown days in summer (all villages)					16	Average costs (all villages)	116	2.30
Average breakdown days in summer (SEWA villages)					20	Average costs (SEWA villages)	162	2.60
Average breakdown days in summer (control villages)					10	Average costs (control villages)	26	1.75

Note: [a] The data are averages from 77 respondents from SEWA villages and 35 from control villages (see footnote 6).

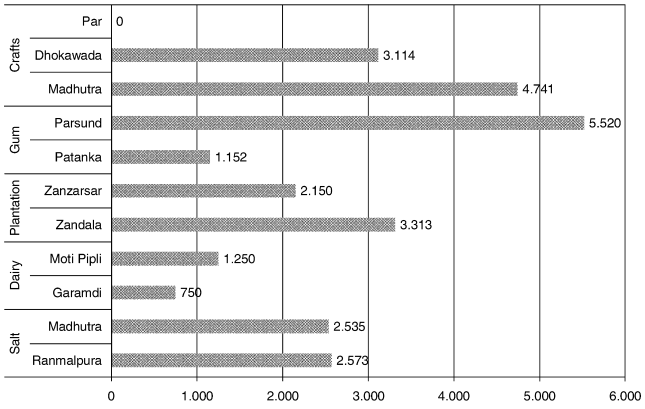

Figure 2. Potential annual household income from work in micro-enterprises on time saved from improved water supply in SEWA villages

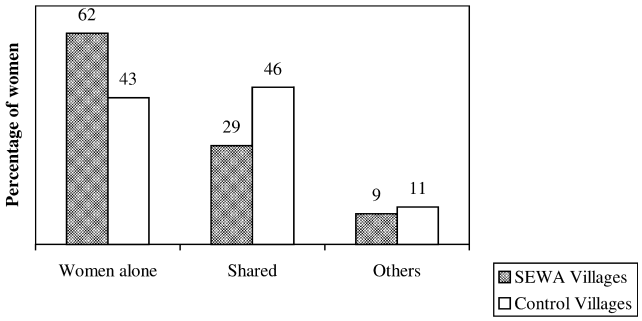

Figure 3. Women's control over their use of time in SEWA and control villages

between SEWA and control villages on a number of essential gender indicators, such as possession of assets, participation in decision-making, and community management. On many issues, progress has been significantly greater for members of women's micro-enterprises ('enterprise women'), even those in more backward and traditional communities, than for women in the control villages. For example, during a water supply breakdown, 'enterprise women' received more help from other household members (husbands, sons and daughters) than did women in the control villages. On some issues, however, there has been little change in both sets of villages. For example, the changes in gender relations have not extended to the daughters: in both SEWA and control villages, daughters assist their mothers in household work more than sons.

Using information collected through participatory methods, changes in gender relations were evaluated according to the following five criteria:

- women's control over the use of time saved by improvements in water supply;
- women's control over the use of money earned from micro-enterprises;
- women's freedom to participate in community activities with the time now available and in view of changing gender relations at home;
- women's involvement in managing community water supplies; and
- men's perception of changed gender roles and positions.

The main findings are the following.

7.1. Women's control over use of time saved

In the majority of the cases, there were no major differences between 'enterprise' women and women from control villages. Most women in both groups (91% and 89% in SEWA and control villages) decided either on their own, or jointly (with husbands or elders) how to use the time released from water collection.[12] The remainder of the women in both groups (approximately 10%) had no say in how they spent this time (i.e., others decided for them). These women tended to be unmarried and/or recently married young women who, according to local customs, still have a subordinated position in their households.

7.2. Women's control over extra income earned

'Enterprise women' had some control over both their own income from this activity and over combined household income, in contrast to women in control villages, who had very little say in how either their own or household income was spent. Table 4 shows that 99% of the women in control villages did not have any say in the spending of their own income. It also shows that enterprise women had varying degrees of control over income: most control over their own income from micro-enterprise and least over combined household income.

Table 4 also brings out the following points:

- in both SEWA and control villages, most women spend most of their money on domestic expenses;
- all women buy water, but not regularly; and
- enterprise women spend significantly less money on personal items and healthcare (perhaps due to SEWA's development efforts — see Box 2).

7.3. Women's freedom to participate in community activities

Gender relations with respect to women's participation in community activities have changed over the last ten years as part of an on-going process of social change: Fewer women eat alone; more women go out alone; more children go to school; and so on. Focus-group discussions revealed that these changes are more marked in the homes of enterprise

[12] It is interesting to note that while the study team had assumed that decisions by women alone demonstrated more control than decisions women took with 'others', the women preferred taking these decisions with their husbands rather than by themselves.

Table 4. Women's spending out of their own income in SEWA and control villages[a]

	Expenditure shares from income earned by women (percentage)	
	SEWA villages	Control villages
Personal items	5*[b]	14*
Childcare/education	7*	3*
Healthcare	7*	12*
Domestic expenses	34	35
Social events	10	10
Working capital	8	7
Assets	10	7
Water	5	3
Savings	3	1
Debt repayment	10	6
Total	100%	100%

Notes:
* Row-wise pairs of data.
[a] Women in control villages also earn income, though not through micro-enterprises. See text in Section 4 for a description of work, other that in micro-enterprises, undertaken by women in all surveyed villages.
[b] Row-wise pairs of data marked with an asterisk (*) can be said with 99% confidence to be significantly different (using an independent samples T-test as explained in Table 2, note d.

Table 5. Changing gender relations in SEWA and control villages

Aspects of gender relations	Perceptions of women[a] in			
	SEWA villages		Control villages	
	Past	Present	Past	Present
Harmony in family	91%	97%	76%	91%
Eating together	52%	84%	52%	88%
Going out alone	62%	90%	58%	76%
Children going to school	63%	91%	84%	91%
Women having own savings	15%	77%	18%	24%
Women participating in cropping decisions	8%	69%	28%	63%
Women participating in cattle purchase decisions	17%	72%	13%	61%
Women having own assets in their names	15%	42%	0%	15%

Note:
[a] The perceptions of the 16 groups of women (11 in SEWA villages and 5 in control villages) of past and present situations regarding various aspects of gender relations were elicited from each group separately using participatory tools.

women, be it going out alone, having savings, owning assets, or making sure children attend school. Similarly, enterprise women participate more in community level activities than women in control villages (see Table 5). This applies to attendance at public meetings (whether with women only or mixed), attendance at (mixed) village meetings in one's own village and in higher level meetings in another community, speaking up at such meetings, and being a women's leader in one's own village and in a cluster of villages.

7.4. Women's involvement in managing community water resources

Although the collection and allocation of domestic water for the household are considered women's issues in both types of villages, enterprise women are more involved in the management of community water resources than women in the control villages (Table 6). However, neither group of women has much influence over preferred source of water, which is the centrally maintained and managed comprehensive piped water supply.

7.5. Men's perceptions of changed gender roles and positions

Although men were initially surprised to be asked about gender relations and found them harder to discuss than did women, in both SEWA and control villages men stated that they felt that gender relations within households and within the community had changed (see Box 4 and Figure 4). More men in the SEWA villages than in the control villages, however, were aware of these changes.[13] The two negative changes mentioned by the groups of men were:

- women get to visit places that men had not; and
- there is disrespect for age and male status. For example, some responses were, "Daughters-in-law don't tolerate dominance of the elders and answer back immediately"; "Nobody cares for the elders"; and "More conflicts and quarrels between husband and wife".

The main reasons for change, according to men in the SEWA villages, were enterprise activities and an increased exposure to the outside world, while in the other villages it was attributed to changes in society as a whole.

8. Findings and policy implications

The major findings of the study are the following.

8.1. Improving domestic water supply in rural areas can be justified not just by the reduction in women's drudgery in water collection, or by 'soft' concerns like improving health, hygiene and sanitation, but also by the substantial economic returns that improved access to water can generate

Further, improvements in water supply can contribute to the empowerment of women by enhancing their social and economic status, both within the household and in rural

[13] Content analysis of the semi-structured interviews showed that men in SEWA villages also saw more changes (140 types of changes) than men in the control villages (32 types of changes).

Table 6. Women's role in water management in SEWA and control villages

Gender and water management decisions	Women's perceptions as to whether men, women or both took the decisions[a] (Percentage of decisions taken)					
	SEWA villages			Control villages		
	Men	Women	Joint	Men	Women	Joint
Decisions on investment in traditional water sources (e.g., well, ponds, and streams)	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
Decision about construction of traditional water sources	38	25	38	85	12	3
Decision about upgrading of traditional water sources	42	27	31	77	3	21

Note:
[a] The perceptions of the 16 groups of women (11 in SEWA villages and 5 in control villages) on who took gender and water management decisions, men, women, or both, was elicited from each group separately using participatory tools.

Box 4. Benefits of women's empowerment in the eyes of men

Only a few men stressed the welfare benefits of women's income generation projects, i.e., the value of these projects for women's traditional gender roles, such as better management of the home and greater cleanliness of the children. The majority mentioned economic benefits, e.g., "We survived this drought because of women's income."; a greater equality between the sexes, e.g., "More and better communication between women and men", "Husbands asking for and following advice from their wives", "Men taking over women's domestic tasks when women do productive work or have to go out"; and changes in women's empowerment, e.g., "Women are more respected in the household and the community", "Women have more freedom of movement", "They have a greater say in and influence over agricultural and village decisions", "Women now advise men on hygiene". Interestingly, quite a number of male groups mentioned how the empowerment of poor women has also empowered them as poor men. They pointed out that having their wives and daughters work on SEWA-supported micro-enterprises had had positive spin-offs for them, e.g., because their wives pass on newly acquired agricultural knowledge to them and because the programmes have started a village-wide economic development process. The initiatives of the women have further stimulated poor men to take an interest in village affairs and play a more active role. As husbands, they now get more respect in the village because of the improved status of their wives.

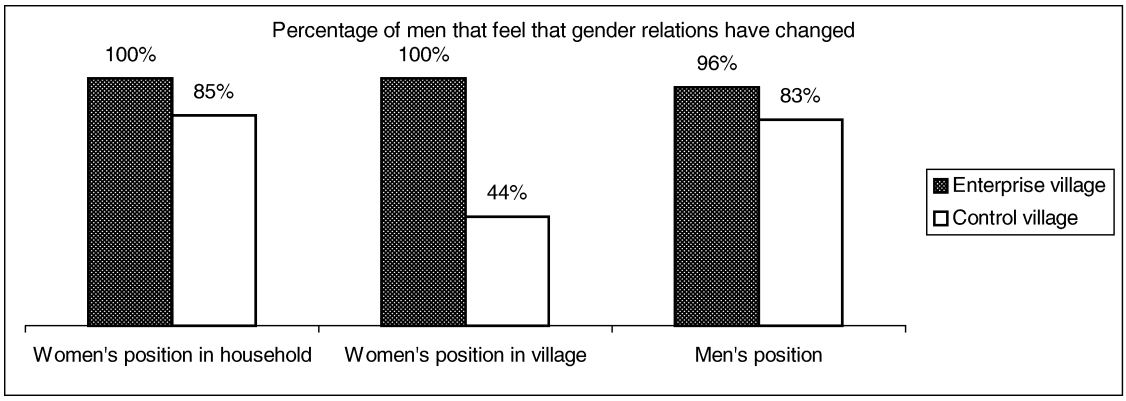

Figure 4. Men's perception of changes in gender relations in SEWA and control villages

society as a whole. Providing improved water supply alone, however, will not translate automatically into economic returns, but will need other facilitating factors (see below).

8.2. Women can make an important, even critical, contribution to household income if they are facilitated to earn money through micro-enterprise work

In the context of poor rural women, three facilitating factors are crucial:

- assistance with organizing group-based micro-enterprises;[14]
- time available to invest in micro-enterprise work; and
- supportive gender relations within the household that allow women to invest time in micro-enterprise work.

In the present case, SEWA provided the first facilitating factor, and the Santalpur RWS provided the second, at least to some extent. The third factor was initially provided by SEWA's programme to motivate women into forming and working in groups, although the success of the micro-enterprises definitely stimulated further change.

8.3. Micro-enterprises that provide income at times when alternative employment is not available contribute more to family welfare than those that operate during the agricultural season

However, to the extent that these micro-enterprises require water, a necessary condition for successful income-generation is the availability of sufficient water for basic livelihood requirements, especially during the dry season.

The major policy-implications of these findings are the following.

- *Water supply projects*
  Domestic water projects should include in their design benefits of time gains and small-scale economic uses of water specifically geared to poor households, and should link up with enterprise projects that turn such time uses into income, particularly in areas where shortage of water, and high time and energy requirements for water hauling, are serious constraints on development. Further, involving empowered and earning women in decision-making of decentralized community infrastructure projects can improve the effectiveness of community infrastructure projects involving water distribution and management.
- *Micro-enterprise projects*
  Projects or programmes that seek to involve rural women in micro-enterprise work need to ensure that adequate time is released from their daily routine to enable them to take up such activities.
- *Rural livelihood projects*
  Projects or programmes that aim to support rural livelihoods by reducing the time spent by women on household chores (e.g., collecting water, fuel wood or fodder) need to supplement these activities by providing micro-enterprise initiatives that enable women to use the time saved productively.
- *Poverty alleviation projects*
  In a situation where existing strategies for poverty alleviation have, by and large, failed to uplift the poorest of the poor, the fact that rural micro-enterprises can produce higher incomes for poor women implies that the development of rural micro-enterprises and ways to release time (e.g., by improving drinking water supply, or shortening the time required to collect fodder or fuel wood) can become important strategies in the alleviation of rural poverty.
- *Government drought-relief programmes*
  Government drought-relief programmes that focus on providing wage employment to needy men and women during droughts can also channel money into organizing micro-enterprises for poor men and women (under an efficient plan for managing and marketing the output), and earn a return on the investment alongside providing relief income.

The basic point, nevertheless, is a simple one: providing poor rural women with earning opportunities and the time to exploit these can result in income that sustains them through crises. If improvement in rural water supply releases the time, and micro-enterprises provide the opportunity, then women can indeed transform time saved from water collection into money. Investment in rural water supply will then provide dual benefits: the social benefits of an improved water supply and the economic benefits from the time saved. It is time policy-makers paid more attention to the benefits of combining these two aspects in the design of policies for sustainable water supplies, sustainable poverty alleviation, sustainable micro-enterprises, and thus, sustainable development.

[14] During the last two decades of rural development in India, the focus has been on organizing the poor into groups, in policy sectors as diverse as watershed development, water and sanitation, participatory irrigation management, joint forest management, etc. Such groups, be they self-help groups, savings and credit groups, youth groups, forest management (JFM) groups or water user associations have shown better results than development-policy efforts focused on the individual, epitomised, for instance, by the Integrated Rural Development Programme (IRDP) of the 1980s in India. Thus, while it may be true that individuals have benefited from micro-enterprises made possible by improved water supply, it is group-based efforts that have borne fruit in the Indian case. To set up group-based micro-enterprises requires organizational effort.

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