

**WOMEN AND ENVIRONMENT
IN THE THIRD WORLD**

Alliance for the Future

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CHAPTER THREE

The Invisible Water Managers

Water is the source of all life (Koran).

In 1980, the United Nations proclaimed the period 1981 to 1990 the International Drinking Water Supply and Sanitation Decade. The UN called upon its member states and specialist agencies to "promote full participation of women in the planning, implementation and application of technology for water supply projects". The UN also urged the "organs, organizations and bodies of the UN system concerned with the Decade ... to take fully into account the needs and concerns of women" (UNICEF-INSTRAW, 1985).

Since the UN Water Conference of 1977 and the subsequent launching of the Water Decade, awareness of water as a critical issue in development has increased. Water is acknowledged as the basis of life; securing a safe and adequate supply of it is now a major task for every government. But the fact that women have specialist knowledge here, know where to collect water and how to cope when supplies are scarce, has been consistently neglected in development programmes. Several factors restrict women's influence over this area of their lives. Cultural traditions, for example, ensure that women in many societies are not permitted to intervene in decision-making, especially at the higher levels. Male heads of household decide where to build the family home, without necessarily considering the distance to water sources; water collection is not their concern. Often, ownership limits the access that women have to a water source. In Sri Lanka, for example, access to wells is determined by the caste or religious group to which a person belongs. In many societies, household budgets are controlled by men and credit facilities are not often available to women to allow them to make improvements themselves. Nor is their participation encouraged in projects which require technologies that only men have been trained to apply. Educationally, they are severely disadvantaged by high rates of illiteracy. In all, women are much less able to express their concerns or their considerable knowledge, certainly in writing. Communication

with development planners, therefore, is a near impossibility.

This chapter looks at the position of women as water managers. It charts the degradation of water supplies, the traditional role women have played and the effects upon them of changes in water management. The conclusions and case studies suggest that water projects can be devised which both involve women and benefit the community as a whole.

GLOBAL DISTRIBUTION

Although 70 per cent of the earth's surface is covered by oceans and seas, fresh water is limited: it makes up less than 3 per cent of the total water mass. Most of this is ice or snow: much less is easily available for people to use. Nor is it well distributed over the world. The amount of water available in any area is limited by the hydrological cycle and by the size and development of the local population (World Resources, 1986). Whereas the total volumes of fresh water existing locally have hardly changed for centuries, water is now used very differently, and in ways which condition how much of it can be available for families. In developing countries, most water is now used for irrigation, although about 10 per cent goes to industry and an increasing amount is used for municipal purposes (UNEP, 1982). All these uses compete with family needs.

Drinking water comes from rain, rivers, streams, lakes, springs, wells and other groundwater sources. But although groundwater is potentially an important future water source for developing countries, only small amounts are presently economically exploitable (World Resources, 1986). Meanwhile, people in many parts of the world must depend upon rain as their main supplier of fresh water. But here, too, the quantity and quality is highly variable, especially in the drought-prone countries of north and sub-Saharan Africa, the Arabian peninsula, southern Iran, Pakistan and western India.

ENVIRONMENTAL DAMAGE

Droughts have always existed in certain parts of the world. But more and more evidence, particularly since the most recent Sahelian drought, suggests that these are not entirely natural (Wijkman and Timberlake, 1984). According to some climatologists, human interference with the

environment may itself prolong dry periods, and many land management practices damage ecosystem balances which greatly influence the availability of water resources.

Overcultivation of cropland, overgrazed rangelands, deforestation and irrigation all change fertile agricultural land into salty, barren deserts. Stripping the vegetation exposes soils to the desiccating effects of solar radiation and the eroding impact of rain. High rainfall intensities may cause the soil to seal so that water flows off the land, causing severe erosion and downstream flooding. This erosion, the lack of water upstream and the downstream inundation can destroy productivity on a vast scale – it is estimated that deforestation and overgrazing alone are turning six million hectares of cropland into desert annually (UN Commission, 1987).

Irrigation now accounts for the largest single share of global water use – 73 per cent. But although irrigation is used extensively to increase crop yields, its efficiency is often low. In Asia, it is not uncommon for 70–80 per cent of the water drawn from a river for irrigation purposes never to reach its intended destination (World Resources, 1986). The heavy use of groundwater in dry areas depletes waterways and lowers the water table – and natural recharging takes much longer than depletion.

In northern China, the water table in some areas is dropping by four metres a year. “The depletion of groundwater resources in India, through deforestation and the other consequences of large irrigation schemes, has left 23,000 villages without drinking water” (Nalni Jayal, 1984 IUCN General Assembly). The improper design and management of irrigation projects has also brought salinization, alkalinization and waterlogging to fertile lands. Globally, salinization may have damaged 1.5 million hectares of agricultural land (World Resources, 1986).

In other words, changing land uses aimed at producing economic benefits can cause water shortages for many people, and often create associated pollution problems elsewhere. For example, in the manufacture of coffee, much water is used and polluted which people living downstream from the coffee plant are obliged to drink.

Pollution is now a major concern of water management. It derives not only from industrial processes and urbanization, but also from agriculture. In Malaysia, more than forty major rivers are so polluted (with the effluent from oil-palm and rubber industries and sewage) that they are almost devoid of fish and aquatic mammals (World Resources, 1986).

WOMEN'S WATER NEEDS

Even in the urban areas of developing countries, only 25 per cent of people have access to an in-house or courtyard water source; in some rural areas, safe drinking water is only readily available to a tenth of those who live there. The World Health Organization estimated in 1980 that more than 70 per cent of the rural populations of Kenya, Tanzania and Angola have little or no access to safe water. So limited is the access to water that some Third World women spend up to four hours every day collecting it. They do not have vehicles to carry it, as men so often do; they must transport the water on their heads.

Water is needed for many purposes in the household – sanitation and waste disposal, child care, vegetable growing and food processing. Women not only collect it for domestic purposes, but also sometimes for economic use. They may keep animals to complement the family diet and to earn money through their sale and their products. Water is also needed for crop growing and the brewing of beer, to soak seeds before they are planted and to prepare food for hired labour or for neighbours working on their plots. The provision of adequate water is an essential prerequisite if women are to become more effective income-earners. Time saved in water collection directly influences their ability to be successful in these activities, which provide them with a better chance of feeding themselves and their families and so improve their health and potential productivity. The time saved in water collection benefits not just women themselves but usually the rest of the family and indeed often the whole community. Studies have shown that poorer women, who spend more time on income-earning activities and therefore have less time for water collection, often have to accept water of a lower quality, which threatens their health and welfare.

Women as water managers

Women have to decide:

- where to collect water, how to draw, transport and store it;
- how many water sources can be used and on their quality for various purposes – for drinking, washing and in the kitchen; and
- how to purify drinking water using simple techniques (such as filtration) or materials available from the environment.

The importance of water quality for health is clear: most human diseases are transmitted by water (cholera, typhoid, infectious hepatitis) or are otherwise water-related (bilharzia, guinea worm, malaria,

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sleeping sickness, yellow fever) (CIDA, 1985). The evidence is that women usually take a great interest in health care. They are the ones concerned about proper waste disposal; they look after personal hygiene and take responsibility for the cleaning of latrines, the washing of clothes and dishes and the house cleaning. Because all of these tasks require water, women have established ways of reusing waste water to conserve supplies (van Wijk-Sybesma, 1985).

Over centuries, women have acquired extensive knowledge about water quality, health and sanitation. It is a knowledge they share; especially with their daughters and with each other, for women continually exchange information on these subjects at their meeting places – often the water source itself. Drawing on this knowledge, women often create their own effective primary health-care networks. (Formal health-care centres are not always accepted by local women, especially when they have not been consulted or involved in establishing them.) Through the generations, women may have developed unique customs in regard to water collection. In segregated communities, for example, women are sometimes not allowed to be seen in public. Their daughters therefore bear the burden of water collection, causing them to forsake schooling and other youthful activities.

Any effort to improve local water supplies must take account of these related issues, both general and specific. Not only do women need sources close at hand to save them valuable time in collection, but water points must continue to play their part as informal meeting places where women can exchange information and learn from each other. Moreover, educating women towards a better understanding of health care, nutrition and sanitation is likely to be most effective if the educators build on these local village networks.

Urban areas

Most women in cities depend on public faucets. The supply of water is not always continuous; waiting times can be long. Poorer city-dwellers use public water faucets to bathe, but this is difficult for women where there is no privacy. In the slums and on the outskirts of the cities, there are few or no public water points: water must be collected from sources outside the city or from vendors whose prices can be high, and whose water quality cannot be guaranteed.

Waste disposal is a major problem. In densely populated areas without latrines, many women suffer from waiting to find a suitable time and place for excretion. They often have to walk long distances to find a private site, or they must attend to their needs after dark, with all

the personal safety risks that entails (van Wijk-Sybesma, 1985). But there are pioneering projects – for example, Pakistan's Baldia project discussed in Chapter 6, and the case of Rochina, Brazil on page 39.

The response of development agencies

Water projects designed to improve local conditions and to help families and small industries still take a low priority in development programmes. Generally, governments and donors favour large-scale, prestigious water schemes. But even where local projects are important, water points are often decided upon and introduced by men (UNDP, 1985). Some of these, because of the nature of their ownership or the arrangements made for their management, are not accessible to women. Handpumps, for example, are sometimes too heavy for women and girls to operate. Development agencies and their engineers are still installing schemes without giving enough attention to those who will implement them. It is often assumed that women cannot be given the responsibility for maintaining a water point. Yet, where women or women's groups are in charge, the evidence is that they maintain water sources well. Where they are trained in management and repair, water points often function more effectively than when the responsibility depends upon a technician living some distance from a local community.

International Drinking Water Supply and Sanitation Decade

Two years into the Decade, it became clear that women were still not adequately involved in its activities. In 1982, a Steering Committee for Cooperative Action established an Inter-Agency Task Force on Women and Water to develop a strategy for evaluating and emphasizing women's participation in the work of the Decade. It was concluded that *their participation would increase only if better communication* took place with existing women's organizations, if technologies were chosen more carefully, if more women were trained in the maintenance of equipment and if water and sanitation projects were seen as part of a comprehensive local programme of health and welfare improvement.

Education and training are being stressed. As well as learning about the maintenance and repair of water points and sewage systems, family members, especially children, have to be shown the importance of properly disposing of their faeces and washing their hands (particularly before they deal with food). As part of the Decade, studies (using local interviewers) are being made of existing patterns of water use so that these can be made more sanitary and efficient (UNICEF/INSTRAW,

1985). Special meetings of women will be organized to find out their problems, their knowledge and their wishes. Local women as well as women teachers, nurses and midwives are being trained to pass on the knowledge, and advice handbooks will be prepared for distribution among women's groups. Special attention is being paid to the effective training of women in water management - ensuring child-care arrangements so that women can attend training sessions, involving them in the development of their own training materials, and in the coordination of training efforts among field staff concerned with water, health and welfare. Throughout, the emphasis will be on strengthening existing community structures.

More appropriate technologies, based upon local knowledge and local materials, are likely to be introduced as the Decade proceeds. Already there is closer involvement of village communities in the planning and implementation of new water sources.

In small ways, the Decade is already showing results. By 1990, it is estimated that almost every village in Thailand will be able to provide a minimum of two litres of safe drinking water each day for each person, as well as basic sanitation for every household. This success is due to the local, decentralized approach of working through district and village organizations with funds allocated directly to them and to appropriate supporting institutions. In a number of countries, UNDP is supervising a regional programme of water improvements involving women in the projects' design and execution. The programme will include research on needs and the education and training of local workers to be sensitive to women's requirements (UNDP, 1985). UNDP intends this to be a demonstration programme of the value of community participation in water management.

CASE STUDIES

THE WOMEN'S DAM, BURKINA FASO

For over a decade, aid agencies spoke of the great potential of the Yatenga plateau, Burkina Faso, for irrigated agriculture, cotton growing and grain production. The problem, year after year, was severe water shortages. Rains were erratic; when they came they would quickly disappear deep into the earth. The groundwater table was such that the only practical means to a permanent

water source would have been drills and pumps. But in the villages, many traditional means of catching surface water were employed. These consisted of hand-dug drinking holes, wells and small earthen dams. The wells and dams were built mainly to meet the daily needs of people and their animals, for water shortages brought great hardships.

The villagers of Saye talked for years of building earthen dams to catch the rainy-season waters and hold them longer into the next dry season. But still in 1979 nothing had been done. Finally, during one of the most severe water shortages known, village women organized a meeting. Three representatives approached village men to state that if they could not be persuaded to help build a dam, then the women would build one themselves. If this could not be done, they were resolved to return to their parents' villages where there was more water. *The women were not willing to continue carrying water over long distances, pounding grains and gathering fuel.* The men realized the seriousness of the situation. And after all, the elders had placed their faith in the ancestors and Muslim God to bring back the rains, but none had come. Perhaps the women were right; it was time to try something new.

The date was set for work to begin. Minata, leader of the women's group in Somiaga, a neighbouring village, came to help Kadiisso, traditional healer and leader in Saye. Youth groups arrived with long drums strapped to the backs of their bicycles. The older *griots* (traditional court singers) carried drums in their arms as they walked. Villagers came in donkey carts with loads of women and children. Eventually, hundreds of people from more than three villages had gathered. It was the dry season and there was little other work to be done. Each had his or her task. The old men who could not work sat under trees, watching toddlers and encouraging others. Some grandmothers worked in the gravel pits, loading baskets and pails for the younger women to carry four kilometres to the work site. *The final day of dam work was celebrated by feasting and dancing.* Everyone was invited and everyone came. Among the honoured guests, Minata from Somiaga received the greatest attention. Crowds recognized the familiar tribal scars on her face as she stepped up to sing with the women of Saye. They sang of beautiful trees and plants which would grow around the dam. Minata composed a song:

We worked together to gather stones
We made a dam;
All the men who travelled to Mecca say they gathered stones
to throw at the evil tombs of disbelievers
Like them, we gathered stones
But we were going to build a dam,
A future for our children, our village, for Burkina Faso and all of Africa.

When she stopped, the women encircled her and would not let her leave. Festivities continued long into the afternoon until clouds gathered overhead.

Then the villagers dispersed and, a few hours later, the first rains of 1981 fell in Saye.

In the nearby village of Somiaga, villagers consider Saye to have been a testing ground for their own dam. One man said, "We learned from the women in Saye that dams should be built; we also learned from their mistakes." But the mistakes did not discourage them from trying new things. With 1,600 inhabitants, Somiaga had almost four times as many workers as Saye, so their dam could be finished in less than three months. Others would also come to help.

The importance of self-reliance is one of the most significant lessons of the dam-building projects. The integration of water and sanitation activities with other dimensions of development is leading to integrated rural development. The dams serve as a point of entry into the broader aim of reviving the spiritual, social and cultural vigour of traditional societies.

Source: Soon Young Yoon, 1983. Adaptation by Stephanie Flanders, IUCN, 1986.

WATER FOR HEALTH IN KENYA

KWAHO - the Kenya Water for Health Organization - is a consortium of NGOs established to respond to women's self-help efforts for water and sanitation improvements. KWAHO, with other groups, is developing the methodology and materials for community liaison and training. The programme is supported by the Kenyan government, the United Nations Development Programme (UNDP), the World Bank and the United Nations Development Fund for Women (UNIFEM).

One example of its work is in the Kwale District, south of Mombasa, where KWAHO is organizing a cooperative programme to train women to use and maintain simple water systems. In this pilot project, villagers are taking responsibility for all phases of handpump installation and maintenance. Cooperation between project staff and the community has been developed by five female extension workers and a process of village-level decision-making. Discussions have been held about villagers' needs for water, including specific items such as the number of wells required, their siting, and the ownership of wells and handpumps. Wells have been constructed of local materials and with labour provided by the villagers, from whom funds have been collected for maintenance. Training has been provided in handpump maintenance, group organization and book-keeping. A complementary project is training women in health, water use and maintenance.

Because of the success of the pilot project the methodology is being applied throughout the entire district. Extension workers have been selected to spread messages about health and water use to local communities and 24 female trainees from the Kwale region are participating in the general training

programme. Village-level training courses are scheduled, and household surveys to collect data on water use, storage and sanitation facilities are in progress.

The project is being carefully evaluated and, from time to time, workshops are organized to assess the effectiveness of the entire programme and to decide how it can be expanded to other parts of Kenya and possibly other developing countries.

The Kabondo Women's Group

KWAHO also supports the Kabondo Women's Group in Wangapala, a small town in the densely populated area of South Nyanza, western Kenya. Here, there are some five hundred semi-permanent, tin-roofed houses and an average family has twenty members. Most of the people are farmers and everyone owns a piece of land. The area has a good rainfall so crops of coffee, groundnuts and maize are sown twice a year.

During the Mexico Women's Conference in 1975, it was decided to mark the beginning of the Women's Decade with a "Women and Water for Health Project" in western Kenya. The Kabondo Community Self-Help Group was already active in the area, helping small farmers to cultivate in time for the rains. Most members of the group were women; occasionally some husbands joined. The community faced a serious problem of access to drinking water. The nearest source, a spring, was at a distance of six miles. Every day, women had to trek down the hill and then climb back with the load of water. It was a time-consuming and back-breaking job.

Through the Kenyan office of UNICEF, women from all over the world provided the funds and technical assistance for the project. The villagers voluntarily dug the trenches and a pipeline was laid. UNICEF supplied the equipment needed to pump water from the spring, which was at a lower level than the village.

There are now four water points in the village and the government and local authorities assist with the pump's maintenance. Usually, the headmaster of the school or the chief of the area takes on the responsibility for the daily running of the pump. There are no paid workers: all the tasks are undertaken by the community and the members of the Kabondo group. Water is available throughout the day at all points. Every family contributes about thirty shillings a month towards the costs of diesel fuel and maintenance. To improve the facilities available for health care, there is a plan to extend the pipeline to the Health Centre, which is three miles from the school.

The project received financial assistance from national NGOs such as KWAHO and Zonta Club, and initial funding from UNICEF. The project today is completely self-supporting. Women used to spend most of their day fetching water and collecting firewood. Now, they have time to engage in other activities. KWAHO provided the women with tree seeds and they have started

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to grow fruit and firewood trees around their homes. Some have taken to vegetable cultivation, selling surplus produce to increase family income. They are also involved in other income-generating activities, such as bee-keeping and the milling of maize grain to make posho.

People are healthier because of the addition of fruit and vegetables to their diets. Because of the abundance of water, the environment and the children are cleaner. The community spirit among members has increased and they are engaged in many group activities. They have started a land donation scheme whereby each member, by rotation, donates a piece of land for the group's use for a limited period. All members work together and grow cash-crops such as groundnuts and bananas and the money earned is banked and used for starting new projects like the installation of the posho mill.

This project shows how fruitful it can be to work with an existing group when such a group considers a project to be its responsibility, not an imposition from some international agency. It is essential that proper leaders are identified: the ultimate success and speed of implementation depend upon the quality of the leadership. Support is also important, including that from government officials, chiefs, sub-chiefs, social workers, teachers and - of course - the people.

Sources: Prahba Bhardwaj and KWAHO, 1984; UNDP, 1985.

WATER FOR ROCHINA, BRAZIL

Rochina is one of the shanty towns of Rio de Janeiro. Its population lives in poverty. Many in the illegal settlement live in wooden shacks, though others live in brick and stucco houses with a water supply, paved streets and electricity. But throughout the shanty town, raw sewage and garbage accumulate next to people's homes, along paths and on vacant land. The filth is washed down into open drains in the rainy season and often these flood the low-lying parts of the town, contaminating water supplies. Children usually fetch and carry the water for their families and take away the refuse, often playing in it.

Community groups have always been active here in cleaning up the town and improving its sanitation. But alone, they were never very successful. In 1979, the local authority together with UNICEF began an urban development plan for Rio, with the emphasis on improving living conditions in the shanties. Community participation - involving women and their groups - was at the heart of the strategy. A successful method of collaboration evolved between local community groups and the government.

At first, although the shanty residents agreed that health and sanitation improvements were needed, they were wary of outsiders. In 1981, three pilot projects began: on basic sanitation, community schools and health care. To build up local trust, part-time community workers were recruited to identify the

priorities. It was decided to add to the sewage system that local people had already started to build; with government and UNICEF help, the new system was completed, serving 120 families. The area around the public water tap was drained and paved and the municipality began a garbage collection system. In all this, the local community provided labour, equipment and materials and organized the work, keeping the cost of the project low.

Now, the community is no longer suspicious of outside agents (and is demanding more technical support). The community workers proved to be very effective helpers and good motivators of local residents. The project demonstrates the value of combining the efforts of community, government and UNICEF. UNICEF expects gradually to withdraw from the project, shifting the responsibility to the local authorities. Wide publicity has encouraged other shanty towns to become active in seeking improvements.

Source: Chauhan *et al.*, 1983.

CANAL HURTS COLOMBIAN WOMEN

In fishing villages along the Pacific coast of Colombia the gathering of cockles (locally called "piangua") is one of the major sources of women's income. Their livelihood is threatened by the Esteros Project, which involves the construction of some four thousand kilometres of canals to link the tidal creek system between Buenaventura and Tumaco. Preparations are already under way for dredging and excavation, although this will be necessary only in shallow stretches that, it is estimated, occupy less than 10 per cent of the total canal alignment.

As part of an environmental impact study (which is legally required in Colombia) by the National Colombian Institute for Environmental Management (INDERENA), a special survey was made of the environmental impact of dredging and excavation on the mangroves and their associated cockles, and the piangua fishery. Socio-economic data were obtained through interviewing the local population, village leaders and women's groups; several case studies were carried out.

Although it was not possible to quantify the effects of the canal alignment on other natural resources, the research team concluded that the destruction of the *Rhizophora* (mangrove) forest would have an effect on the productivity of estuarine organisms that depend on that habitat during part of their life cycle. More severe, however, would be the impact on the income of the women in the fishing village of Salahonda. The researchers found that the piangua catch declined significantly after dredging and excavation had begun. Before the works, catches varied between 300 and 500 cockles a day, while the study indicated daily catches of 150 to 350. In interviews, the women confirmed that there had been a decline in catches. Completion of the canal works and the

consequent loss of suitable piangua habitat would result in a net loss of 4.1 million Colombian pesos a year of potential income for local people.

How to limit the damage done by the canal? It was decided that only limited areas would be dredged and excavated. At the same time, local communities would benefit from the canal works because of the better accessibility to markets and lower transport costs. Finally, women's groups were set up in the project area and provided with better canoes and small outboard engines to enable the women to reach less accessible piangua areas.

Source: Netherlands Directorate General for Development Co-operation.