

# Gender aspects in the management of water

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*Water resources increasingly need to meet the demands and needs of different sectors and to be protected against deteriorating quantity and quality. This paper discusses the different interests of men and women in the use of water resources, and what effects the neglect of female interests in particular, has on development. The authors stress that besides class and ethnic differences, the different interests of men and women also play a role in the cross-sectoral management of water resources. Water pricing, property rights and management structures are three key aspects where a gender approach is required. In the management of water resources in smaller catchment areas, several instruments for a gender approach have been developed. Discussed are gender specific participatory research, planning and tools, gender in management organizations and task divisions and involvement of multidisciplinary teams with a gender orientation. Copyright © 1996*

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The many different ways in which water is used and managed often have distinct implications for men and women users. Use, access and control over natural resources such as land and water, and tasks, means and responsibilities are highly gender specific and may vary considerably for different water uses. However, gender awareness varies widely across the different water sectors, and no concerted attempts have been made in the past to consider the gender perspectives in an integrated way (SIDA, 1994).

The Ministerial Conference in Noordwijk, Netherlands in 1994 endorsed an Action Programme for governments to tackle key issues of the United Nations Conference on Environment and Development (UNCED) Agenda 21. A number of key principles are advocated, among which are the creation of partnerships among all stakeholders and the involvement of all sectors of society in resolving the problems that affect them through management at the lowest appropriate level. Furthermore, the application of sound economic principles to the allocation and pricing of water is stressed, based on the principle that water is both a social and economic good.

This article discusses water uses and the differential impacts on men and women at household and community level. It is based on lessons learned from user-managed irrigation, water supply and environmental sanitation, both in rural and densely settled low income urban areas. It concludes that

effective water management requires a genuinely participatory approach that avoids presenting the illusion of homogeneity and gender neutrality, but rather emphasizes the different activities of household members to ensure that different uses and impacts of water are recognized and accounted for in the management of water resources.

## Gender in the different water sectors

1. In the development and management of water resources it is still rare for implementing organizations and programme staff to ask who requires water for what purposes at household or community level, and what effects demand regulating measures and management structures have on these uses and user
2. groups. For many years programmes dealing with irrigated agriculture, domestic water supply, environmental sanitation and industrial development have seen the household as the lowest homogeneous unit of production, consumption and decision making. Yet in most cultures men and women, often supported by children, do different work, have different access to resources and different areas in which they can make decisions and exercise control over resources and benefits (Overholt et al, 1991).
3. Water plays an essential role in rural and low income urban societies, to meet domestic and agricultural requirements as well as in construction, food processing and cottage industries, such as local

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textiles and potteries. A gender specific division of tasks, means and responsibilities associated with these practices often significantly influences other uses. In Afghanistan, for example, the customary involvement of women in the chemical dyeing of wool and silk for the textiles industry has ensured that washing is restricted to particular periods, or that water is rerouted to non-domestic users in certain communities.

Worldwide, almost 75% of our water use is taken up by agriculture (63%) and domestic water use (8%). The latter includes water for water borne sewerage, which frequently is flushed untreated, together with other wastes, into surface waters. Together, these water use and waste disposal practices, and changes in them, have a significant impact on the future availability and reliability of clean water. In the next section we will discuss these practices and how their impacts differ within the household for men and women.

#### 4.1

##### Gender and agricultural water use

Agriculture is the prime subsistence and economic activity in developing countries. It accounts for by far the largest proportion of water used. Especially in rural areas agriculture determines to a large extent the way in which water is managed at community and household level and plays an important role in the division of water related tasks, means and responsibilities of men, women and children.

In many rural societies, starting from a young age, men and women take on different tasks. Analysis of the gender division of labour in Dang, Nepal (Bruins and Heijmans, 1993), found that men dominate land preparation and irrigation activities, while women tend to be responsible for transplanting, weeding and harvesting. Furthermore, women dominate all tasks, bar ploughing, on non-irrigated crops and provide twice as much labour input to irrigated crops. Results of the research on the Gujarat Medium Irrigation Project, India (Gopinath and Kalro, 1985) found that women took on the largest responsibility of tending and milking livestock, while men dominated monetary activities, such as buying inputs or marketing produce. In Africa a similar division of labour pattern relating to irrigated crops is found. Men tend to work intensively for short periods and women work throughout the season, though women are also often responsible for marketing crops (Feldstein and Poats, 1994; Holcombe, 1994).

Water provision in irrigated production is generally controlled by men. Men are also able to influence associations which are responsible for infrastructure, and water allocation and scheduling. Even production from women's fields and household gardens is often controlled by men to a certain degree, as well as availability of water for non-agricultural tasks. In Comoe, Burkina Faso (van

eg.

**Table 1** Differential impacts of irrigation projects on women and men

Type of impact	Questions related to gender divisions
Increase in production of cash and/or food crops	What is produced? By whom?
Increase in labour demand	Who does the paid work? With what tools? Who does the unpaid work (at home)? With what tools?
Increase in income	Who gets the income? Who has a say over the use of income?
Changes in land tenure	Who used the land for what? Who has the rights to the land (ownership, decisions on use)
Changes in domestic water use	How much water is used? For what purposes is it used? How is it used?

Source: Cloud (1993).

Koppen, 1990). women were in charge of rice production on the lowlands and men worked on higher value crops on the rainfed uplands. Development staff nevertheless deferred to the men for inputs on the design and management of new rice irrigation works, despite the fact that the men had limited knowledge of irrigated rice and that their interest was limited to land value.

Irrigation projects affect the different land, water and time use patterns of men and women. These are elaborated and are set out in Table 1, which gives five areas of impact, based on how production, labour, resources and income are divided.

*Increase in production.* Irrigation, ranging from hand watering (Figure 1) to irrigation systems of various sizes, may lead to an increased production of crops managed and controlled by men, and/or increased production under women's control. Increased production may be used to supplement the family diet or raise family income through the sale of crops, and is reflected on a regional economy through a reduction in the need for imports. Under large-scale irrigation projects, current management regimes emphasizes the production of cash crops, which have higher water requirements than traditional crops (Shiva, 1988). Recognition of the beneficial nature of both men and women's water uses in crop production can lead to successful expansion of small-scale irrigation and an overall increase in productivity, as illustrated in Box 1.

*Increase in labour demand.* Irrigation often greatly affects local labour patterns within and between households as well as the control over labour resources. Landless male labourers may see their opportunities for paid labour increased with a



Figure 1 Productive use of water in a communal garden in Senegal. Credit: INSTRAW/ILO 1986

**Box 1 Increased crop productivity by men and women resulting from appropriate small scale irrigation, Zimbabwe**

In Ruda and Hauna, Zimbabwe, communities traditionally practising bucket irrigation on the banks of a nearby river (3km away) developed a piped irrigation system to both private and communal land within and near villages with the support of a local NGO (Manicaland Development Association). The primary aim of improving crop production was easily achieved as men had more time available to work nearby fields, and water, though restricted through bucket and hose pipe irrigation, was more easily available. The women were also able to increase their production, as they were able to irrigate vegetable gardens near their homes and the proximity of the fields gave them more time for agricultural care.

*Source:* Carter (1989).

growth in irrigation; for women such paid labour tends to be more seasonal. The introduction of irrigation into a region often creates more work for women and children in sowing, transplanting, weeding, harvesting, storage and food processing of crops. This leads to an increased work burden for them when other chores are not sufficiently reduced and women and children do not get the same access to better tools and equipment for farming and food processing as men (see Box 2). Though men's burden also increases, as family head they generally retain control of resources, products and the purse strings. Such an imbalance may either have a negative effect on family health or crop production (van Wijk, 1985, p 20).

*Increase in income.* Whether the increase in production leads to an increase in income depends

on the marketing opportunities for the various products, as well as on who gets and controls the income. In many societies there is no single household purse, and income from irrigated crops is not necessarily used for general family consumption. Often women contribute labour, but the men sell the products and receive the money. It is difficult for women to make legitimate claims to this money and to ensure that part of it is spent on household needs (van Wijk, 1985, pp 50, 109). In Vietnam and Zimbabwe men and women were able to increase their incomes, as both could raise their production.

**Box 2 An irrigation and drainage project in Vietnam and its impact on women**

The irrigation project in Thanh Lang in Hai Hung Province in Vietnam has put an end to seasonal floods. Two rice crops and one vegetable crop per year have become possible. Negative impacts are more work for women and an increased need for fertilizers as with the end of the floods silt deposits have also stopped. The women value the increased income from cash crops and trading vegetables, but have less time than before for child care, women's meetings and leadership. Men are ready to admit women's increased and double work burden and help in water collection, which makes some difference. They also value women's economic role which has resulted in women having a greater voice in decisions in the household. If the project were to do the same and extend training, credit, machinery and other essential resources to women and involve them in planning, the project would fit more properly into local sociocultural relationships and improve the chance of the innovations being sustained without negative impacts on wider socioeconomic development.

*Source:* Hitchcox (1992).

In these cases, women maintained their rights to a share of the resulting increased household income, since they controlled cash from the sale of particular crops (Carter, 1989; Hitchcox 1992).

*Changes in land tenure.* Irrigation and the development of agro-industry often have implications for existing land rights and tenure practices. Men may try to reallocate or take control of land managed by women either to increase their personal control of crop production and any associated income, or alternatively to benefit from the increased value of land resulting from the addition of irrigation and other infrastructure (van Koppen, 1990; also see Box 3). Such changes in land tenure are often encouraged inadvertently by programme staff who fail to ascertain customary laws or rights, or simply find it easier to involve only men in programme consultation and activities. As a result, women may lose control of their section of family land, participation in communal lands or lands traditionally allotted to them, with an associated loss of independence and income. This often forces them to start buying home products at the market. The combination of lower production of subsistence crops and loss of income can have dramatic effects on family health if heads of households limit the funds available to women. Thus it occurs that malnutrition and diseases becomes prevalent among children in areas of high cash crop

**Box 3 Implications of land value and appropriate technology for gender control**

On the shores of Lake Victoria, Kenya, four separate women's associations groups in Rongo Nyagowa, Kokise, Aram and Nyanduzi coordinated the upgrading of existing bucket irrigation to pumped and piped systems on their small vegetable plots. To avoid health risks three women's groups developed sprinkler systems. The fourth preferred simple basin irrigation. Unfortunately the extra investment costs in sprinkler equipment were unwarranted, since the nearness of the Lake Victoria, a major water source where transmission of schistosomiasis occurs, was of far greater health significance than ponded water. Also piped sprinkler systems reduced individual control over water. Due to overdesign and higher pressure requirements the large pumps installed could only be started by men, reducing women's independence and despite higher yields the cost of diesel for larger pumps meant bucket irrigation was more profitable. Furthermore pipe infrastructure increased land value, encouraging men to try and usurp women's control. On the other hand the simple basin system ensured clear delineation of land avoiding disputes, and the smaller pump used ensured women's continued control and lower running costs. The primary problem with this low cost system was that its success was restricted because the small pump did not enable an expansion of irrigated land.

Source: Carter (1989).

production, such as western Kenya, or where households sell limited products to obtain other goods, as has happened in northern Afghanistan.

*Changes in domestic water use.* When an irrigation scheme brings water nearer to homes, it is generally also used for domestic purposes. Although planners may recognize this, irrigation systems are rarely structured or planned to improve access for such uses, thereby failing to optimize the positive impacts of the system. Irrigation canals and control structures can have a positive impact on family life, as time saved in collecting water may be used on other work or social duties. The increased volume of water collected may improve hygiene, habits and subsequently improve family health; water may be used for woodlots and plant nurseries and so further increase productivity. However, poor system design and the ponding of water may promote disease and illness, by increasing the transmission of faecal-oral diseases and schistosomiasis from sick to healthy people. The correlation between the reported incidence of urinary schistosomiasis and water practices in a study in Tanzania showed, for example, that such incidence is highly gender specific. Reported cases were highest among boys aged between 6 and 16, who used the infested water source for swimming, and among women and girls of between 14 and 40 who used the source for clothes washing, thereby standing in the water for 15 minutes or more (Kirimbai and van Wijk, 1983).

Whether irrigation increases such risks depends on the local circumstances and practices. The knowledge of schistosomiasis as a water related disease was a reason for the three women's groups in the case study described in Box 3 to opt for sprinkler rather than gravity irrigation. However, this choice turned out to make little difference for health because other risks of transmitting schistosomiasis remained present. At the same time, the higher yields and land values encouraged the men to try and usurp the women's rights.

Practices of supply and management of irrigation water can improve, but can also worsen domestic water supply conditions, especially when the source of irrigation is groundwater. In Maharashtra, India, the boom in sugar production, also stimulated by a considerable subsidy on electricity for water pumping, multiplied the number of deep tubewells for sugar cane irrigation. The shallower sources for domestic water fell dry and women saw their burdens of fetching water to serve household needs considerably increased. This development had a particularly negative effect on poorer women who had no access to the private wells for domestic use (Rao, 1991).

*Gender and domestic water supply*

2 The differences in interests, work and control between men and women which come to light in

Table 2 A summary of gender issues in domestic water supply

Issue	Questions
Information and communication	Are men and women informed about technology options, and service levels in terms of convenience, costs, possible water uses and potential social, economic and health consequences?
Decision making	Do women and men have a say in the choice of technology and service level(s)? In the distribution and location of waterpoints? Who chooses the location and additional facilities at communal water points? Who designs, pays for, manages these facilities?
Education and training	Who receives what type of training and education? Do women and girls learn new skills, eg in construction, maintenance, administration? Are men and boys included in education and training on the preservation of hygiene, or do training and tasks go to women and girls only?
Work and functions	How are work and functions divided between women and men? Who does the lower-type physical work, such as environmental cleaning? Who gets paid? Do those paid do all the work or is an unskilled portion delegated to (unpaid) relatives?
Water use and control	Who uses the water for what purposes? Who determines and controls this use and allocates scarce water? Who uses the catchment areas and for what purposes? Who controls the uses which affect the water supply's water quality and quantity?

irrigation also play a role in domestic water supply. Table 2 contains a summary of such gender issues.

*Information/communication.* When water projects are undertaken, it is generally male staff and male local authorities who are involved. Local institutions in which women are present, such as women's organizations, church groups and schools are seldom involved in contacts between project staff and village authorities. Channels used for information and communication, such as public meetings and written materials, are also male oriented. Women cannot attend public meetings as easily as men, and if they can, they often have to stay on the edge and keep silent. They also have less access than men to written information because of the lower proportion of literate women and lower knowledge of official languages. As a result, the knowledge and expertise of women, which differ from those of men because of their different tasks, cannot play a role and its value is not acknowledged. Projects that assume that information intended for women may equally well be communicated to men do not recognize that in many cultures each gender has its own channels and topics of communication. Hence the women concerned may not necessarily be informed or consulted (van Wijk, 1985, p 56).

*Decision making.* Women are often the most motivated to establish and maintain an improved water supply, yet they do not necessarily participate in water supply decisions and management. In a women's dance the women in Misalai, Tanzania, expressed their dissatisfaction over a drinking water supply project, which had failed to bring water to all parts of the village. The community had volunteered to dig the trenches and women had turned up in much higher numbers than men. But when the pipes were finally laid and the water had been connected, it went only to the part of the village where the government leaders were living. The women criticized

this result and said that unless the issue was solved they would no longer turn up for volunteer development work (Mlama, 1994).

The location of water points is another aspect where needs and interests of men and women frequently differ. Sometimes men want the source outside the community for cattle watering, while women want it inside for ease of access. Or women want the source outside, so that they have privacy for meeting and washing, and land for a communal vegetable garden, but men want it inside the community for greater control (IRC, 1994).

*Work and functions.* The recognition of women's work in water supply has led to an increased presence of women on the committees that manage community drinking water systems. With appropriate training, women have often been found to make excellent treasurers, while the chair tends to be held by men. Essential for a good gender balance in domestic water committees has been the conscious review, by men and women, of the reasons for the presence and functions of either gender on the committees. An externally imposed gender balance has generally not worked. After the construction of a new water supply women are usually recruited as volunteers for the upkeep of hygiene and preventive maintenance, which is the most frequent work, while men receive skilled training and paid jobs in maintenance and repair.

*Education and training.* Water supply projects emphasizing training and education tend to follow the norms of industrialized countries; they tend not to look at local divisions in skills, authority and places of work. Men are usually given training, equipment and paid jobs for simple maintenance and repairs. Women get training in health and hygiene and are asked to maintain hygienic conditions at water points. The latter calls for more

frequent physical work, but is unaided by equipment and unpaid. Moreover, in the prevailing culture incentives for trained men to visit domestic water points for preventive maintenance may be low, because their lives tend not to be affected negatively when the water system breaks down, while frequent visits from men to water points used by women are culturally sensitive. In health education, on the other hand, projects expect women to change the hygiene habits of the whole family, without considering that women may not have the time and financial means for their own changes and that they have no influence to change the habits of male family members who are over the age of 8-10. Projects thus tend to withhold skills and authority from women in aspects where they can make a difference and neglect men in aspects where male resources, authority and change are required.

*Uses and control over water.* Where good water is scarce and men and women need it for different purposes, such as household uses and cattle, competition and conflicts over its division are common. Examples are livestock areas in Botswana, northern Tanzania and Gujarat (India) and areas where a high fluoride content in groundwater damages the teeth and bones of humans and animals, eg in parts of Andhra Pradesh in India. Conflicting interests over water and land use in the catchment areas of community water supply systems also have an increasing negative impact on the availability and quality of drinking water (Box 4).

#### *Environmental sanitation*

The lack of safe disposal of human and industrial wastes is the main cause of the growing contamination of water resources and the high costs of water treatment. So far, national governments have given far less attention to the improvement of sanitation than to the improvement of water supply, even though all agree on the need for improving the two together, both for an impact on health and to keep the supply of safe water affordable. Yet the results from the International Drinking Water Supply and Sanitation Decade (1981-90) were far better for water supply than for sanitation. After ten years 1350 million more people in developing countries had received improved water services as against 750 million that obtained improved sanitation facilities. After deducting the population growth of 700 million people the net gain has been 650 million people with an improved water supply and 50 million people with improved sanitation. This sanitation gap is only increasing.

One of the reasons for the poor progress in environmental sanitation is perhaps that while a good drinking water supply is a human need with a high political priority, sanitation has a generally lower priority, and the consequences of poor sanitation are felt more by women than by men. Van Wijk (1993) advocates a gender approach in planning, implementation, management and evaluation of environmental sanitation programmes (Figure 2).

## A

### **Box 4 Participatory review to mediate competing water resources in Felidia, Valle de Cauca, Colombia**

The gravity water supply of Felidia village depends on a mountain stream, which is also used for irrigation and to feed a fish pond. The water quality is affected by different problems in the catchment area including erosion as result of deforestation and agriculture, chemical contamination from fertilizers, herbicides and pesticides and biological contamination both of human and animal origin. There are some 100 families living in the water catchment area which have no connection to the water supply scheme, as this would require pumping. They have their own individual or small group systems mostly fed by small springs. The main water supply system includes multistage filtration, which during rainy periods has to cope with high turbidity levels. Another important problem is the high water use in the supply system. The system is managed by a local water committee elected by the community.

A participatory review of the situation in Felidia implemented with support of the Centro Interregional de Abastecimiento y Remocion de Agua (CINARA) and the Secretaria de Salud Publica de Cali, clarified a number of the problems. It identified agricultural practices in the catchment area as a main cause of the problems, with no easy solution as many families depend on the subsistence agriculture being practised. It showed pressure problems in the distribution system and interruptions in supply, which are particularly a problem for women. Another clear problem was the high water loss because of problems in the main line and the distribution system, poor tap maintenance and the low awareness about the need for better water control. Furthermore, some water of the system is used for irrigation and several houses in the community are being used only during the weekend by families from Cali, who mostly have a higher water use as several have installed swimming pools. Interests thus differ strongly and require a process of mediation and debate to facilitate the introduction of metering and progressive tariffs. Recently a new water committee was selected; one of its members followed the CINARA/IRC management for sustainability course. This committee is taking things in hand, with support from the different institutions from the municipality of Cali. They have made improvements in the catchment area, have repaired a major leakage and reduced their backlog in payment considerably. They regularly publish water quality data, which have showed a great improvement. Similar situations have been identified through participatory research in other communities in Colombia, stimulating water committees to take action.

*Source:* Unpublished data, CINARA and IRC

## Men and women have Active and Equitable shares in:

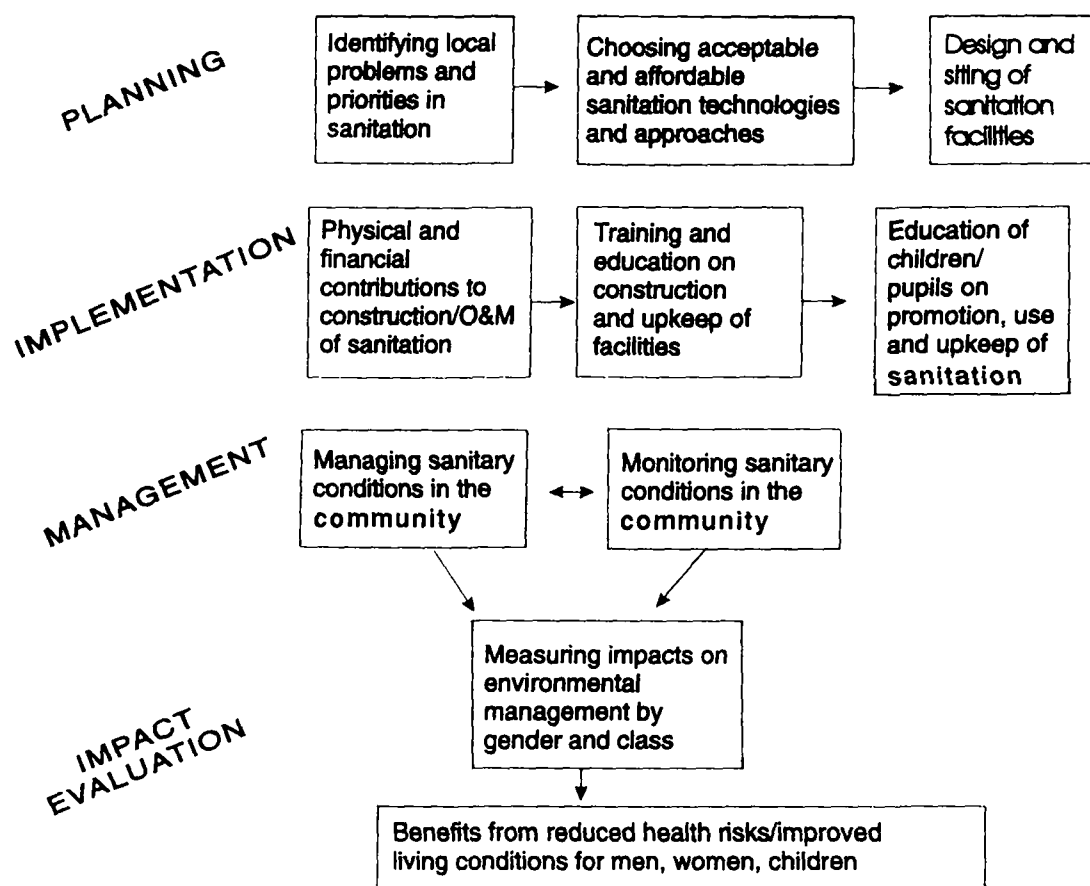


Figure 2 Gender approach in sanitation

*Planning.* A gender specific assessment of needs and willingness to pay identifies differences in interest and motivating factors between women and men. Information needs to be disseminated on the choice of technology and design and location of the facilities and decisions need to be taken by both genders based on their different needs, tasks and areas of expertise. For example, women want latrines to be suitable for children and easy to clean, while men want them as they increase the family's status and the value of the plot (Kurup *et al*, forthcoming). For physical and financial contributions to construction, it is important to find out who in the household is paying for sanitation improvements and what would motivate them to do so. If several members were to contribute, how would such payments be divided? Increasing numbers of women headed households, especially in low income urban areas, have also made it imperative that programmes make special arrangements to enable these women to build and finance sanitation facilities.

*Implementation.* The division of work between men and women is often culturally determined, but environmental sanitation projects can increase women's work. For instance, extra water collection or cleaning falls only to women and girls (Figure 3). Excellent experiences in construction of sanitation facilities have been gained through training women as latrine masons. Women usually already have experience related to the type of work to be done, because of their work in house plastering and the construction of traditional latrines. Other reasons for the success of female masons are that in households women are the most motivated to improve sanitation and they are best reached and motivated by other women. Furthermore, the presence of a craftswoman within the confines of home or compound is in most cultures more acceptable than that of a craftsman. However, generally when the work becomes paid, it goes to men; women no longer participate or become unskilled mason helpers. Why communication,



Figure 3 Water: a precious resource. In all cultures women take care of the water management in and around the home (Zambia). Credit: IRC/Boesveld

training and education need to be gender specific has already been discussed in the context of water supply projects.

*Management and evaluation.* Water supply systems are usually designed for a longer period and can serve a growing number of households for a period of 20 to 30 years. Sanitation programmes usually cater only for the existing number of households and need to be continued permanently, if population coverage levels in project communities are to be preserved. Many current sanitation programmes provide services to individual households, creating local dependencies on outside resources and interventions for as long as the number of households continues to grow. Moving away from dependency requires a shift from providers' programmes to programmes that establish capacities and financing mechanisms with which local households can install their own facilities and local communities can manage their own programmes for physical and behavioural change. The capacity to assess and monitor local conditions and practices is an important part of such management capacities. In a programme in Kerala (South India) monitoring the environmental

sanitation conditions and practices by neighbourhood committees of men and women stimulated local governments to cofinance sanitation improvements. The monitoring also revealed who in the household uses the latrines: women, men, children (Kurup et al, forthcoming).

### Gender and water resources management

The above sections show that because of the differences in production, labour, responsibilities and resources, women and men have different interests in and benefits from the availability, use and management of water. As a result they often have different criteria to evaluate the adequacy, equity, timeliness, convenience and quality of various interventions. And not only do the nature and degree of women's and men's interests and needs differ, but women and men often also have different perceptions about the costs and benefits related to participation in the various types of water user's groups through which water use and management are organized (Zwarteveen, 1994).

There is reason to fear that such gender differences are not sufficiently taken into account in international water resource management developments. Although the importance of strengthening the role of women in the management of water resources has been mentioned in the various international conferences dealing with water resources management (New Delhi, 1990; Dublin, 1992; Rio de Janeiro, 1992), the instruments through which water resources are being managed, and the issues which are being emphasized, in fact tend to weaken the position of women in water resource management (Elson and Cleaver, 1993). The principles formulated and advocated by the international community, such as regarding water as a social and economic good, and the management of water resources at the lowest appropriate level, are not gender neutral and therefore should be analysed more in terms of gender specific consequences before widespread implementation.

#### *Gender implications of water resources management principles*

While the overall effect of water conservation and demand management should be of benefit to all members of society, some of the mechanisms used to manage water demand can have detrimental effects on women's daily activities.

*Water pricing.* In the desire to economize on water use and reduce wastage, the concept of water as a basic human need tends to be overshadowed by the idea of water as a commodity. However, water pricing has several gender specific implications. For instance, women tend to have less access to monetary funds than men; similarly women's income is more likely to be earmarked for different forms of



expenditure than men's. Through households men and women do to some extent pool and share money, but again this is generally biased against women, which restricts their access to money. A high price for water can bar especially poorer women from access to improved water supply for basic hygiene, consumption and food production.

In the drinking water sector, properly designed progressive block tariffs can help to subsidize poorer sections of the community; but there is a danger that less discriminating pricing mechanisms, such as water rationing and intermittent supplies, will further marginalize women. Such mechanisms frequently lead to long queues, and may drive women, as water carriers, to more distant and less safe water sources.

Nor should it be forgotten that the increasing cost of drinking water production is partially caused by overwithdrawal of groundwater for irrigation and contamination of surface water by industries and lack of proper disposal of household excreta and waste. In such cases the domestic water users are asked to pay a tariff of which part is caused by lack of integrated water resources management. To avoid negative impacts from a more realistic pricing of water based on production costs, the relationship between price and value, and the divisions between productive and domestic water uses, need to be clarified in terms of the requirements of men and women users (SIDA, 1994).

*Ownership.* Another aspect of the move towards the market system is the issue of property rights and ownership. The desirability of ownership is a much repeated and rarely challenged theme in recent statements about water, with ownership of water supply facilities being associated with responsible water use and improved operation and maintenance. The creation of property rights over any resource inevitably involves the power to exercise these rights to exclude non-owners. It is known that women are in a disadvantaged position in relation to property rights, particularly over productive resources, such as land, livestock, even their own labour. It is optimistic to assume that vesting ownership of a water source in the community will give women equal rights over that resource, and far more likely that the creation of ownership rights will confer opportunities for the rich and powerful to appropriate preferential access to the resource. Management at the lowest appropriate levels should facilitate the desired fuller involvement of women at management and policy levels, by including gender analysis in all procedures involved in water resources management.

*Management.* The practical and strategic constraints to enable women to take part in management from the lowest levels cannot be underestimated. While the differential needs and interests of women and men with respect to water resources management

may call for the inclusion of both in planning and decision making, women and men will often have different perceptions about the costs and benefits involved in participating in users' groups. Participation may be less attractive to women, partly because their costs and time spent travelling or attending meetings may be relatively higher, but also because social norms and values are not always supportive of women engaging in public meetings and managing organizations (van Wijk, 1985; Zwartveen, 1994).

### **Gender sensitive approaches to water management**

How do projects and programmes deal with gender as one of the planning aspects in water resources management? In the last decade planners throughout the water sector have come to recognize the value of participatory approaches, and more recently participatory approaches with a gender focus. The workshop on gender and water resources management organized by SIDA (1994) in preparation for a larger OECD/DAC meeting brought together both examples of programmes that had negative consequences, because they either excluded women or overburdened them, and programmes with better direct and long-term results because of a more balanced gender approach.

The Small Scale Flood Control, Drainage and Irrigation Project and the Food for Work projects in Bangladesh are examples of projects where women with their vital roles in food production, storage and processing have been bypassed even more than men in the choice of technologies and other planning decisions, or have been targeted as beneficiaries of a welfare approach (Thomas, 1993). More positive are the experiences in the Communal Water Points Project in Malawi, a water supply programme with participation of low income urban groups and the urban sanitation programme in Recife, Brazil. In these projects community participation with a gender focus made a significant difference to the performance of the project and gave women management roles exceeding those of men (Kwaule, 1993; Cavalcanti Arrais, 1993). At the same time Kwaule points out that shifting the balance from men to women was no solution either, because it caused men to oppose women's roles or even to withdraw from the project, so that the women were left to carry out single handedly all physical and financial tasks related to community management of water and the environment.

### *Participatory research and planning*

In developing a gender approach, participatory research and planning techniques are instrumental, provided that the instruments themselves also look at gender and are used gender specifically. Such

techniques differ from the more conventional one-way socioeconomic studies, such as surveys, where the researcher determines the questions, collects the answers and carries out the analysis and interpretation away from the people. The information thus obtained remains within the boundaries set by the researcher's questions, and those interviewed are alienated from the knowledge originating from them, offering no chances to discover new linkages or to correct misinterpretations (Lammerink and Wolffers, 1994).

In participatory research, the researcher contributes the structure, but the participants determine the information flow and, in the participatory process, they can bring up data which the researcher was not consciously looking for. The facts and new insights gained are shared by all participants. When research is carried out together with local men and women, adjusted to or compensating for their time use and using gender-specific techniques, it not only gives insights for better programme performance and extends development benefits to women and men, but often provides an eye opener for the people themselves, who look at reality from a new perspective and come to see gender not as a static condition but as a dynamic and man-made process which, as all human processes, is subject to change (Box 5).

**Box 5 Analysing gender conditions as a basis for change: a case from southern Tanzania**

In Ruvuma in south Tanzania, a rural resettlement scheme caused women to lose their land use and voting rights and increased their workload. When the researcher made the villagers aware of this process, most of them voted for women to have a share in the land use and the inhabitants of 11 villages jointly decided that in their villages the women would take part in all village decisions, work three hours less than men on the fields in order to leave enough time for domestic work and share equally in all profits. The system worked for three years until it was disbanded by the higher authorities, who considered it subversive.  
*Source: Brain (1976).*

Participatory planning also goes beyond conventional planning techniques. In conventional planning with communities a ready made plan is laid before a community assembly for information, promotion and acceptance; the latter usually by acclamation. In participatory planning, the planners assist the various groups of stakeholders to consider a range of options and their consequences and choose those technologies, designs and maintenance, management and financing systems that best fit their needs and potential. Thus the technique combines the knowledge of external specialists with the local knowledge of the various groups in the communities and catchment areas.

*Tools and techniques*

Participatory research and planning make use of several techniques, such as gender specific participatory rapid appraisal (Guyt, 1994) and participatory activities to plan, organize and monitor change in a gender-sensitive manner (IRC, 1994; Wakeman, 1995). Box 6 contains a description of a tool used for making participatory inventories of women's and men's practices in water management and use from catchment to cup, creating awareness, planning change and introducing a management information system at the community level.

**Box 6 Participatory tool to assess water resources management practices in small catchments and plan and manage improvements**

The tool for participatory assessment, planning and management consists of a set of coloured triplex elements which representatives of the various land and water user groups use to lay out on the ground a picture of their local water resource system. Choosing from a box filled with elements, the participants in the activity first lay out a picture of their local river basin with the source, catchment area and physical flow of the river and its tributaries. Choosing again from the elements, they place in the catchment area small pictures of human soil and water use activities affecting the quality and quantity of the water. In the same way they lay out the local water supply system, with its intake, transmission, treatment plant (if any), storage tank and distribution net. Another set of pictures depicts the various water uses in and around the homes. This map is then used to identify which practices exist in the particular water resources system that have a negative effect on the quality and quantity of the water resources and how these effects could be eliminated or reduced. After agreeing on the measures that will be taken, the same tool serves to define and divide the responsibilities and rights in managing the agreed measures between various community members, such as the operator of the water supply, the members of the local water committee and the user households in the catchment area. Finally, the map helps to define the flow of information on water resources management between those taking part in the water resources management system.

*Source: Antonio Rodriguez, CINARA, personal communication.*

Several mechanisms have been developed that enable women to take part in participatory analysis, planning and training activities (Table 3). Although this table lists practical measures to involve men and women in water projects in a gender-specific way, differentiation by gender is not the only differentiation to take into account. Communities are seldom homogeneous entities where the only differences are between women and men. Young women have other work, resources and influence than older women, and poor women differ from the wealthier. Hence participatory techniques will also

Table 3 Ten 'womandments' for a gender-sensitive approach in drinking water supply, sanitation and hygiene promotion

Issue	Project measures
Gender division	The project assesses with local men and women, the work and responsibilities they have in land and water use, care of traditional water sources, construction, care and upkeep of household/school latrines, family health and hygiene, communication with other men, women, and household finance
Information	The project ensures, by using suitable communication channels and methods, that project information reaches men and women (each group may need different channels). In data collection and analysis a distinction is made by sex, as well as other socioeconomic and cultural characteristics
Meetings	Women are assisted in taking an active participation in meetings: time and place suitable for women, women informed and encouraged to attend, seating and language is so all can hear and react, speaking out by women is facilitated (sit together, breaks for internal discussion, choose spokeswoman, etc). Women can take part in a mixed or separate meeting as a condition for project continuation
Decisions	Men and women have a say in and achieve compatible solutions on: design and location of the facilities, choice of local maintenance and management system, choice of committee members, mechanics, caretakers, health promoters, local financing system
Committees	A minimal proportion of committees has to be female or male, to avoid exclusion or overburdening of either group. Men and women choose their own representatives on trust and suitability for tasks. The project encourages a well-reasoned function division (often women are then chosen as treasurers as they have proved to be most trustworthy). Committees regularly account for their proper management to quotas of male and female community members. Higher committees include men as well as women
Hygiene education	Women take part as planners and change agents, not just as passive audiences. Men are involved on male specific issues. Men and women review women's time availability, work load and tools for better hygiene
Training	Men and women are trained for technical as well as managerial tasks. Training provisions are adapted to the requirements of women (place, methods, literacy level). Women are trained and rewarded for new functions, such as waterpoint repair (they visit daily), latrine masons (they can work in homes), treasurers (trustworthy and can do home calls), monitoring ( <i>idem</i> ). Costs of work and benefits (in status, influence, income) are in balance
Access to resources	Knowledge, skills, materials and credit to make their own improvements in water, sanitation, hygiene are available to men and women. Where feasible and relevant, activities are linked up with income generation projects
Staffing	Female staff are employed and equipped, as well as male staff, for dealing with gender issues. In case of shortage of female staff work is done by gender sensitive male staff and female intermediaries from the communities. Payment is equitable
Gender consciousness	Project staff and management are aware why gender is important and how a gender sensitive approach is applied

Source: Van Wijk (1994).

have to consider factors such as age, economic status and ethnic and religious diversity, to ensure that data collection, planning and organization reflect the reality of all those using and managing water.

#### *Building on existing management systems*

It is generally assumed that women manage water at home, while men are in charge of public management of water and water-related human practices. More research on how tasks and responsibilities are divided between the sexes has shown that in reality the situation is much more complex, and that men, women and children are involved in, and have specific knowledge of, tasks and requirements on water resources, water supply and environmental sanitation in the house, the community and the surrounding area (Rocheleau, 1992). Especially in areas where water is scarce and has to be shared for different purposes or where a highly developed water culture exists based on religious connotations, a system of careful water management has developed in which men and women both play public and private management roles (van Wijk, 1985).

When men and women in the south-western part of Burkina Faso were asked who managed the water, both groups were vague and replied in terms of 'the village' or 'the chief and his council'. Descriptions of the actual process revealed that a decision concerning the water sources would first be taken at a women's meeting. The women's spokeswoman would then approach the chief's council, either directly or through a male relative. If the council was slow in organizing a meeting, the women could ask the council to review the progress made. This is an implicit reprimand and always works. The council decides on whether to support the women and arrange for physical and financial resources to carry out the project. With less heavy physical work the women can decide to do it themselves (Donnelly-Roark, 1984). In Sri Lanka managing and maintaining the shared neighbourhood wells is also ascribed to men. In practice women take the decisions and do the work together with the children (Kelles-Viitanen, 1983). When outside funds and planners come in, gender divisions and processes are seldom looked into and women tend to lose their traditional rights (Povel, 1990; van Wijk, 1985).

Cases of preventing or reversing this process of marginalization also exist. In Tonga local women, who had their own management organization dealing with women's issues such as living environment and health, boycotted a community sanitation project when the men's committee and the project agency did not involve their 'committee' in the planning and management of the project. Learning from this failure, a gender approach, with men and women's committees each having their own work and authority, was adopted in the neighbouring village. When the approach turned out to be successful, the process was replicated in 18 other villages (Fanamanu and Vaipulu, 1966).

Povel (1990) describes how the Provincial Irrigation Unit (PIU) of Nyanza (Kenya) supported a women's group who successfully resisted the fact that male landowners began to dominate the group when external funds for improving irrigation became available. The PIU reasoned that if it approved of a male dominated women's organization to run an irrigation scheme merely because of the semi-public and formal management aspects involved, it would automatically restrict the informal influence which the women traditionally have at home and in the community. Dependency on men would become the formal situation and operational and financial management would come in the hands of people who were not the direct users of the scheme. However, it needed a discussion on historic gender relations and the impact of the agency on their change before this viewpoint was shared by the whole (male) PIU staff.

#### Skilled staff

A gender approach in the situation analysis and the planning of problem solving activities and structures is not yet common. The mix of technical, socioeconomic and organizational aspects of water resources management requires multidisciplinary teams which are skilled in participatory research and planning. A gender specific approach in research and planning further requires orientation on gender for these teams and for the men and women who use and manage water resources at the local level. Special measures to involve women, such as the requirement that membership of a water organization includes a certain number or percentage of women, are now often externally imposed without adequate orientation on gender and development issues to the implementing agencies and to the villagers. Imposed gender measures meet reactions ranging from lack of appreciation to open resistance not only among men but also from women. In contrast a joint analysis of gender aspects can lead men to take the initiative in changing gender conditions (Box 5).

#### Conclusion

It was discussed above how changes in water resources use and management without taking gender relations into account can have negative consequences for socioeconomic development. In particular it can marginalize women and, unintentionally, worsen their position. Water as an economic good, water resources management at the lowest appropriate level and involvement of all stakeholders are neutral concepts unless the following questions are asked: Economic for whose economy? Appropriate for whom? Who holds a stake in water and for which uses? In the past, socioeconomic and cultural differences, especially differences in class, caste and ethnic and religious groups, were most significant. In the last 10 years gender differences have come to be recognized as a third type of variable which interacts with the other two but also has its own influence in the use of and say over water. Current research and project work have not only revealed these issues but are also beginning to provide the means for addressing them, notably by making investigations and problem-solving tools and systems gender specific, and equipping staff with the attitudes, knowledge and skills to address gender issues in water resources management and development.

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