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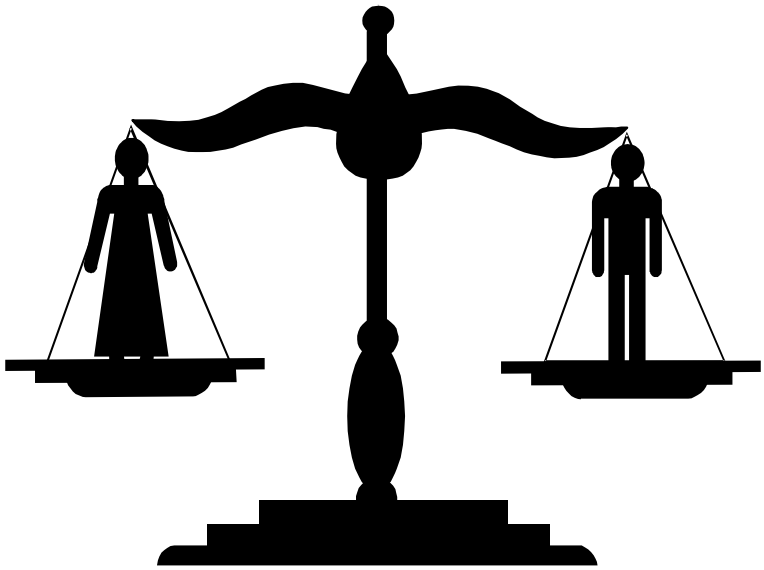
Gender in Water Resources Management, Water Supply and Sanitation

Roles and Realities Revisited



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Roles and Realities Revisited

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Abstract

This book investigates how gender is present in the newly emerging principles on the sustainable management of water resources. The book also reviews how these gender-specified principles are currently applied in the water supply, sanitation and hygiene sector. Operationalization has developed farthest in new drinking water supply services. Participation of women alongside men in planning, design, maintenance and management has brought distinct benefits to the functioning and use of the systems and created more equal chances for training and functions of women and men. Yet a true gender balance, in which benefits, burdens and control are shared equitably for optimal service sustainability and development results remains to be achieved.

In comparison, sanitation development and management lag behind. Yet improved sanitation has tremendous benefits in that it prevents the contamination of water and soil and improves public health. A gender approach in sanitation recognizes and responds to male-female differences in demand, work and opportunities in the different population strata. It helps redress the sanitation imbalance and offers new chances for men and women to jointly manage their own environment and programmes.

While women have initially been bypassed in modern water and sanitation management, men have been neglected in hygiene improvements. In a gender approach in hygiene education the division of work, resources and decision-making between men and women is investigated and each sex is addressed on their own areas of authority, skills and responsibility. This prevents that additional and unpaid hygiene work goes only to women and girls and responsibilitilies of men for work, resource provision and own behaviour chance are overlooked.

The use of a simple gender analysis instrument, which is described in the book's first chapter, has helped in analysing the above developments and is recommended for maintreaming gender as part of programme planning, appraisal and monitoring and evaluation.

Keywords: Water resources development and management, water supply, sanitation, hygiene, gender, gender analysis instrument, literature review.

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Table of contents

Foreword ..... **vi**

Acknowledgement ..... **viii**

Preface ..... **ix**

1. Gender and Integrated Water Resources Management **1**

1.1 Water resources development and management 1
1.2 Gender and gender approach 3
1.3 A framework for gender analysis 10

2. The New Policy Consensus and its Gender Aspects **13**

2.1 Principles of an emerging international policy on water management 13
2.2 Gender in the international fora on water resources management 15
2.3 New policy principles made gender specific 19

3. Gender and Indigenous Management of Water and Waste **37**

3.1 Physical work of women and men 37
3.2 Implications for health and socio-economic development 39
3.3 Management of water supply and waste disposal in the home 41
3.4 Water resources management in the public domain 48

4. Operationalization of a Gender Approach in Drinking Water Supply **57**

4.1 Gender and responding to demand 57
4.2 Gender participation in decisions, implementation and management 66
4.3 Operationalization of gender-specific demand management 86
4.4 Holistic water approaches, participation and gender 92

5. Cinderella and the Missing Slipper: Sanitation and Gender **99**

5.1 Sanitation stays behind 99
5.2 Closing the sanitation gap 101
5.3 Implementing programmes the gender way 109

6. Working for Better Hygiene - Sharing the Tasks **125**

6.1 Health education and behaviour change 125
6.2 Limitations of singling out women and girls 129
6.3 Programme that recognize and reduce women's limitations 136

7. Enabling Agencies 149

7.1 From implementing to enabling agencies 149
7.2 Expertise for balanced participation..... 151
7.3 Organizational support..... 158

Epilogue.....165

List of Tables

Table 1. Current principles on water resources management and their gender aspects.....21
Table 2. Ways to overcome constraints to women's participation 70
Table 3. Pearsons Correlations of Overall Participation and Women's Participation with Benefits of 121 World Bank co-financed Rural Water Supply Projects 86
Table 4. Gender factors underlying latrine demand in Kerala 108
Table 5. Impacts of improved water supply, sanitation and hygiene on morbidity and mortality for six common diseases: evidence from 144 studies.....126
Table 6. Gender and class specific preconditions for community management 150

List of Figures

Figure 1. Division of labour in water collection: men collect water with means of transport for business purposes, women collect water on foot for the family 7
Figure 2. Framework for gender analysis and approach.....10
Figure 3. Levels of decision making: but who decides and influences decisions within neighbourhoods and households? 22
Figure 4. A mobile office brings services closer to the users 29
Figure 5. Spreading connection costs makes taps more affordable 29
Figure 6. Demand management without user participation may have negative socio-economic impacts 40
Figure 7. The water committee signs the contract of a community-managed water supply system in a local bar.....51
Figure 8. Improved washing and bathing facility designed and managed by the users in an Indonesian kampung.....63
Figure 9. Without a gender approach men make decisions and women do the work and manage the resource 67
Figure 10. Pocket voting allows men and women to give autonomous views 71
Figure 11. Participation of women in local maintenance: a woman caretaker repairs one of the many handpumps in Bangladesh.....77
Figure 12. Rainwater harvesting projects, such as here in Tonga, have tended to be women's rather than shared projects, with women groups doing all construction and financing.....84
Figure 13. Women trained as plumbers in low-income areas in Santiago de Chile, can earn an income and reduce unaccounted for water.....89

Figure 14. Coverage of sanitation and water supplies by population from 1980 to 2000 (estimated) 99
Figure 15. Reduction in diarrhoea incidence by type of intervention 100
Figure 16. Using the village map as a management tool, the quartier committees discuss sanitation progress and gaps with the chief of the village 106
Figure 17. Gender-specific demand inventory for latrines through flexible small-scale models in El Hormigiero, Cali, Colombia 111
Figure 18. Block making by women masons (..... 116
Figure 19. Women of a Ward Water and Sanitation Committee monitoring, use, maintenance and operation of the new pour-flush latrines 123
Figure 20. With a gender approach both women and men take part in hygiene education sessions and determine how work, responsibilities and resources are divided ... 135
Figure 21. First and second version of hygiene promotion material: after testing with women and men also pictures with fathers were included in the material 146
Figure 22. Participatory rural appraisal was used in Karnataka to identify and analyse gender and class divisions in amount of water collected 148
Figure 23. Training of village sanitation workers in Orissa, India 153
Figure 24. Women promoters in Guinea Bissau were effective in working with women and women leaders, but needed special training to communicate with male village authorities 160

List of Boxes

Box 1. Farmers and builders suck India dry, by Tara Patel 6
Box 2. Different stakeholder interests in the river catchment area of Felidia, Valle, Colombia 8
Box 3. Water rights, poverty alleviation and gender in Burkina Faso and Bangladesh 30
Box 4. Participatory tool to assess water resources management practices in small catchments and plan and manage improvements 94
Box 5. Orangi sewerage project in Karachi, Pakistan 104
Box 6. Public health communication for selected behaviour change 143
Box 7. Action learning on gender and water supply in Malawi 163

Foreword

Women constitute half the world's population. They are the caretakers of children, the guardians of family health and well being, and frequently the managers of household resources. In the developing world, where millions of families still lack clean water and adequate sanitation, women invariably have to ensure that the family has water. Yet, despite their numbers and their roles and responsibilities, women often have had no voice and so no choice in decisions about the kinds of services--water supply, sanitation, health--that are provided to protect their family's well being.

During the International Drinking Water Supply and Sanitation Decade (1981-90), the development community recognized that greater women's involvement was a critical element in reaching the Water Decade's targets of water for all. New programs were launched by the United Nations system and bilateral agencies that targeted women and sought to broaden their involvement in the planning and implementation of water supply and sanitation services. Women were trained as handpump caretakers and latrine builders. Their participation was mandated in water committees. Busy women became even busier.

From the experiences of the Water Decade and the preparation for the 1992 Earth Summit in Rio de Janeiro, a set of principles emerged that is bringing dramatic changes to water supply and sanitation sector development. As an economic good, water has value and users need to pay. If users pay, services have to respond to demand, i.e., to what users want and are willing to pay for. Women, as well as men, are water users, and so must be able to express their demands for services. At the same time the water sector was learning that services should respond to demand, advocates of women's participation were learning that promoting women's involvement was not sufficient and perhaps not always desirable. They shifted their focus from women to gender--to looking at roles and responsibilities of women and men and how decisions are made.

We now understand that gender-balanced approaches converge with demand-responsive approaches: when service improvements are considered, all users must be consulted about the kinds of services they want and are willing to pay for, including about how those services will be managed and financed once installed.

The challenge before us now is to use these principles and our understanding of them in development programs. Knowledge and tools help us to move from principles to practice. This book is the authoritative compendium of the knowledge gained over more than two decades about women, water, and now gender. Originally published in 1985 under the title *Participation of Women in Water Supply and Sanitation: Roles and Realities,* this updated version captures what we have learned since then, shifts the focus from women to gender, and adds a water resources management perspective. It provides a wealth of experience and knowledge useful for practitioners, policymakers and academicians.

As we seek to integrate gender into development projects, we must not forget, as Christine van Wijk-Sijbesma points out in the very first chapter, that people are diverse in many ways. The difference in interests between the poor women and men and the rich women and men of a community, for example, might be even starker than the differing interests of women and men. Like income level, gender is but one of many aspects of heterogeneity to which we have to be sensitive. We need to be equally alert not to assume, and by acting on our assumptions, to create, differences where they might not exist.

Bruce Gross
UNDP-World Bank Water and Sanitation Program

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Writing a book is a mix of creativeness and perseverance. Several people have helped in either one way or another. Wendy Wakeman, coordinator of PROWWESS in the UNDP-World Bank Program, came in at the initial phase of planning, when we discussed what had changed since the joint publication of Women's participation in water supply and sanitation by IRC and PROWWESS in 1985, and she decided that the Program would co-finance a successor. She also reviewed the final result, having moved meanwhile to a new position in the Bank's Gender Group. Rekha Dayal reviewed the first book when she was stationed at the World Bank and now did the same from a position with the Program in India. As then, her comments were a happy marriage of stimulating praise and thoughtful criticism. Nilanjana Mukerjee, now based in Indonesia, provided practical suggestions on how to use the book as a resource to reach policy makers and government decision-makers. My former post-grad professor in extension science, Niels Röling, also commented on the manuscript's value for recommendations in policy making. He encouraged me to link the present review to more general gender and development theory and to the field study on the role of gender in already sustained water and sanitation services which is planned as part of the next phase of the UNDP-World Bank Water and Sanitation Program. In IRC Stephen Parker took care of the editing of the manuscript and suggested the book's subtitle. Theodora Olsthoorn checked and corrected the many references with help from IRC's librarians Bettie Westerhof, Cor Dietvorst and Nigel Browne. As usual, the desk top editing was done efficiently and rapidly by Lauren Houttuin. To all these kind contributors go my sincere thanks and appreciation.

Christine van Wijk

Preface

The confined nature and unbalanced distribution of the world's stock of freshwater and the growing and competing demands on this stock require us to manage this essential human resource with more sense and care. Attention to the human aspects of the use, development and management of freshwater has become more common. Attention to the gender aspects of water resources development, management and use is far less prevalent. Gender is still often interpreted as women's involvement. The roles and responsibilities of men and the changing relationships between males and females regarding work, influence and benefits are not generally addressed.

This book is a co-publication of IRC and the UNDP-World Bank Water Supply and Sanitation Program. It is a literature review in the context of the new programme of the UNDP/WB on gender, demand response and sustainability, and also a contribution to the work of the gender issues network (GEN NET) of the Water Supply and Sanitation Collaborative Council.

The book is the revised and updated edition of an earlier publication by IRC, PROWWESS and UNDP, *Participation of Women in Water Supply and Sanitation: Roles and Realities,* (1985), which is now out of print. In the revised edition a number of sections that are still valid have been retained. However, the text has been placed within the context of overall water resources management and made gender- instead of women-specific. The book has been expanded to cover recent literature and so gives an overview of gender developments in water supply and sanitation in the context of water resources management from 1980 to 1997.

The aim and structure of the book are threefold. First, the aim is to present a simplified framework for gender analysis which can be used in rapid and participatory assessments and in planning. This framework can be found at the end of Chapter 1. Secondly, the book aims to give an overview of what has been happening at the policy level on integrated water resources management, and to link this to gender analysis. This is done in Chapter 2. Finally, the book summarises and analyses the operationalization of gender in water resources management principles in the drinking water and sanitation sector.

Chapter 3 describes how gender in water resources management already exists in the indigenous management of water resources. Chapters 4, 5 and 6 analyse how gender-based water resources management principles are operationalized in new drinking water supply, sanitation and hygiene promotion projects, and to what effects. The gender analysis framework is used to see how, in these operationalizations, work, influence and project benefits are divided between women and men of different classes and socio-cultural backgrounds. In the final chapter, Chapter 7, the decentralization and devolution process in the water supply and sanitation sector is described and a report presented on

the mechanisms through which sector agencies develop gender awareness and approaches in their work.

The contents are based on publications and reports on gender in water, sanitation and hygiene by many male and female colleagues in the field. Abstracts of most of these documents can be found in *Woman, Water, Sanitation: annual abstract journal*, which IRC publishes together with the UNDP-World Bank Program on Water and Sanitation.

A second important source was the work done by the Gender and Water Divisions of the Swedish International Development Agency (Sida), the Gender Division of the Directorate General of International Cooperation (DGIS) of the Netherlands Ministry of Foreign Affairs, the Working Group on Gender Issues of the Collaborative Council, coordinated by the UNDP-World Bank Water and Sanitation Program, and the Institute of Development Studies of the University of Sussex.

1. Gender and Integrated Water Resources Management

Recognition of the need for integrated water resources management is growing. That such management also requires attention to gender and a gender approach is less universally recognized. This chapter summarises international attention to integrated water resources development and management and explains what gender is, why a gender approach is needed and how it links with poverty alleviation. The chapter ends with a framework for stratified gender analysis on which programme preparation, assessments and reviews can be based.

1.1 Water resources development and management

Since without water there is no life and no development, water has been featuring prominently on the international agenda. In 1996, the United Nations Conference on Human Settlement in Vancouver, Canada called on its member states '...to adopt programmes with realistic standards for quality and quantity to provide water for urban and rural areas by 1990 if possible'. The same conference recommended ' ...to adopt and accelerate programmes for the sanitary disposal of excreta and wastewater in urban and rural areas' (United Nations, 1976: Ch. II). On the suggestion of the United Nations Water Conference in Mar del Plata, Argentina in 1977 (United Nations, 1977) the UN General Assembly of 1980 subsequently made the period of 1981 to 1990 the International Drinking Water Supply and Sanitation Decade (IDWSSD).

Interest in and concern for the future of freshwater resources have been increasing as well. The threatening water crisis and countervailing actions were the themes of four major interregional conferences: the International Conference on Water and the Environment in Dublin in 1992; the UN Conference on Environment and Development: Agenda 21, in Rio de Janeiro in 1992; the Ministerial Conference on Drinking Water and Environmental Sanitation, 'Implementing Chapter 18 of Agenda 21' in Noordwijk in 1994 and the OECD/DAC Meeting of the Development Assistance Committee of the Organisation for Economic Cooperation and Development on Water Resources Management in Paris, also in 1994.

Human interests and concerns for water supply, sanitation and integrated water resources management and development are well founded. In 1981, when the IDWSS Decade began, 25 percent of the urban and 70 percent of the rural population in the South had no access to adequate drinking water and 42 percent of the urban and 86 percent of the rural dwellers had no proper sanitation (Watters, 1989: 23). In 1990 considerable progress had been made, but much of it has been absorbed by population growth. By 1990 the net percentages of urban people without improved services had dropped by only 5 percent for water supply and 3 percent for sanitation. In the rural areas, overall progress was better. In

total 33 percent more people had access to an improved water supply and 12 percent to improved sanitation (World Bank, 1993: 39).

Increased access does not necessarily mean that each household in a community with improved services can and does use them. Many plans and designs have not been sufficiently adapted to user needs and practices for people to start using the facilities. Many other facilities cannot be used because they are out of order for long periods (United Nations, 1990: 3, 44).

Without the Decade, the situation would probably have been worse than it is now. Nevertheless, work to meet the minimum requirement of 50 litres of water per person per day for the first necessities of life, and to ensure a safe way of disposing human excreta and other types of waste remains essential (Postel, 1996: 51).

Meanwhile, the overall availability of freshwater needed not only for drinking water supply, but also for agriculture, natural ecosystems, industries (including tourism) and hydropower is increasingly under threat. The amount of this freshwater is fixed; that is, it constitutes 2.5 percent of all water in the world. Part of this water is stored as groundwater into underground layers. The remaining 110,000 cubic kilometres is surface water, of which two-third enters the watercycle of rainfall-evaporation-rainfall and one-third runs off into the sea. The demand made on the available freshwater is steadily increasing and necessitates a much more careful development, use and management of this crucial resource.

An important reason for the growing pressure on limited freshwater resources is population growth. Population pressure increases because high mortality rates drop off, but high birth rates take a much longer time to go down. A key factor that speeds up a reduction is higher education for women (Falkenmark and Surapto, 1992). Globally, education and literacy of women still lag far behind those of men. Of the estimated 100-130 million children who in 1990 were not going to primary school, over 60 percent were girls. And of the nearly 948 million non-literate adults in the world today, two-thirds are women (Borba, 1997).

Rapid urbanisation increases the pressure on water resources by large and mega-cities. The world urban population was 2.4 billion in 1990 and will probably grow to 3.2 billion in 2000 and to 5.5 billion in 2025. Eighty percent of them will live in the developing world and over half of them will be poor to very poor. The challenges to find adequate sources of water to supply the burgeoning city populations, trade and industries are large. Already some cities have to construct pipelines of hundreds of kilometres to bring in the required freshwater. Other cities, such as Bangkok, Jakarta and Shanghai are overpumping the city’s aquifers for water, causing groundwater depletion and subsidence of parts of the city. Competition with agriculture for water resources around the cities grows (UNEP/UNESCO, 1990: 21; United Nations, 1996).

More freshwater is also needed because of changing lifestyles. When socio-economic development and social stratification set in, water use by higher income groups for sanitation, hygiene and amenities increases (White, 1977). These groups also consume food, and use products, which require a high level of water use. Changes in food consumption patterns have great impact on water use. It takes, for example, about 1000 tons of water to grow one ton of grain and 2000 tons to grow one ton of rice (Jordaan et al., 1993: 11). Planting of sugarcane and fast growing trees for timber production reduces water available for food crops and drinking. Crops with high production, but also high water needs, replace crops with low water demands (Shiva, 1985, 1988). Sugar cane and bananas, for example, need almost four times more water than sorghum and pulses, and brinjal and tomatoes have a return per volume of water used which is six times that of rice (Lundqvist, 1994: 12). The use of fertilisers further increases water demand for crops (Sontheimer, 1991).

These general developments not only have an impact on water use and availability; they also affect the quality of the water resource. Costly water treatment systems are introduced to deal with high turbidity from soil erosion and biological and chemical contamination from human and animal wastes, industries and the agricultural sector. Both high transport and high treatment requirements increase the cost of water and make it less affordable for domestic use and economic development.

1.2 Gender and gender approach

Water resources are managed and developed by humans for humans. Both activities are an essential part of and condition for overall social and economic development. But the responsibilities, power and interests of the people involved and concerned are not all the same. Different categories of people have different interests in and control over the use of water for different purposes: agriculture, domestic water supply and waste disposal, industrial use and waste disposal, aquaculture, transport, energy, ecosystems. Interest groups involve policy makers, utility managers, industrialists, rich and poor farmers, and domestic users.

Often no further distinction is made in these user groups. However, within the categories of end users, men and women have quite different interests and resources. Hence the two categories of users cannot be treated as one and the same. Distinctions are needed in what either category knows, does and decides and what the effects are for them, their families and communities and the programme. A balanced attention to all actor categories optimises social and economic development and reduces competition and conflicts over water. Water resources development and management practices which have a negative impact on women, also have a negative impact on development. Water development and management projects that exclude women as actors and as an interest group bypass half the population and do harm to the efficiency and effectiveness of the project.

1.2.1 Definition

What is gender and what is a gender balance? Contrary to what is still being found in the literature, gender is not only relating to women, but to both women and men. As the Institute of Development Studies of the University of Sussex puts it, 'The gender-based approach is distinct in that it focuses on women and men, rather than considering women in isolation' (IDS, 1995: 1). A group of women and men working in water resources projects in Asia defined gender as follows: 'Gender ...is the result of a socialization process which assigns certain attitudes, roles and responsibilities [to women and men], leading to certain forms of behaviour' (Bolt, 1994: 3). The group stressed that, as gender is a social construction, it is changing with time. They also stressed that, in traditional roles and responsibilities, women tend to be a disadvantaged group in most Asian countries. A gender approach highlights such differences and changes. In particular a gender approach pays attention to:

- differences between women's and men's interests, even within the same household, and how these are played out;
- the conventions and hierarchies which determine men's and women's position in the family, community and society at large, whereby women are usually dominated by men;
- differences among women and among men, based on age, wealth, ethnic background and other factors;
- the way gender roles and relations change, often quite rapidly, as a result of economic forces, migration for work and other social trends (IDS, 1995: 1).

1.2.2 Historical background

The phenomenon that a gender approach is still often taken to mean only changes for women, and not for men, has a historical background (Hannan, 1995: 1). The first expression of concern for women and their involvement in development emerged in the 1960s. Women were recognized as a disadvantaged group, for whom special women's components had to be developed. In general projects, such as in water supply, women were seen mainly as the beneficiaries of the improvements.

In the late 1970s and early 1980s, women began to be recognized as actors and managers of water in their own right, and it was demonstrated that involving women in planning, construction and management, brought benefits for general development, for the projects, for the households and for women themselves (Compare for instance the first edition of this book and publications by Elmendorf (1982), Narayan (1988), PRG (1980), Schmink (1984), Schoeffel (1982) and du Toit (1980).

In the second half of the 1980s and beginning of the 1990s it became clear that the effective involvement of women requires them to unite and develop strength and self-reliance. This enables them to give direction to their lives and circumstances and encourages men to look upon women's participation, not as competition, but as a natural right for women to deal with and decide on material and non-material resources which are

crucial to them. Without such changes it still occurs that women do the physical work of transport, digging, cleaning and caretaking, but have no say in and do not share control of the resources on which their livelihood depends (Groote, 1990; Hannan, 1984, 1995; Mlama, 1994; Wijk, 1985).

Carolyn Moser (1989) has called these stages in development programmes the welfare approach, the equity or anti-poverty approach, the efficiency approach and the empowerment approach. The welfare approach focuses exclusively on women's reproductive roles. The approach sees women exclusively as mothers, wives and housewives. It identifies the women themselves as the problem and places the solution to family welfare in their hands: if the women change their domestic behaviour, better hygiene, health, nutrition, etc. will follow.

In contrast, the *anti-poverty and efficiency approaches* point out that besides being mothers, wives and housewives, women are also economic producers and actors in the public realm. During colonial and neo-colonial times these roles were not recognized and women's position was lowered. This resulted, not only in a loss of status, but also in a loss of sources of income and lower efficiency for projects which bypassed such productive roles.

The *empowerment approach* seeks to identify power, less in terms of domination, which carries the implicit assumption that a gain for women implies a loss for men, but rather in terms of the right for women, as for men, to determine choices in life and to influence the direction of change. The approach challenges women to seek a new self-consciousness and new positions in their countries' legal and civil codes, economies, institutions and management systems.

While a gender approach is becoming accepted in theory, the concept of parallel women's involvement as an 'add-on' still persists in the field, as evidenced by the following quote on a USD 80.2 million salt rehabilitation project in Uttar Pradesh, India:

> 'Under instruction from the World Bank, the project was redesigned to target women. In the name of gender in development, village women were bunched together to form thrift groups, so that one day they, too, might buy land. For the project managers, the women's element -and it is little more than an element- seemed like a side-show. When I told one government official I was more interested in seeing the reclaimed fields than a staged women's group meeting, he said: "I am so happy to hear that. You know, we really are technical people. These social activities, these are an add-on' He stressed that word, "add-on"' (Stackhouse, 1996: 15).

1.2.3 Gender and poverty alleviation

Within a gender approach it needs recognition that the interests of rich men and rich women are not the same as those of poor women and poor men (IDS, 1995; Shira and Bandyopadhyay, 1990; Sida, 1994; Wijk et al., 1996). Box 1 illustrates this at the macro level in India, where wealthy stakeholders' groups have been able to avoid tightening of groundwater abstraction control since 1970. Box 2 illustrates the different interests in water resources management at the micro-level, in a small catchment area in the mountains outside Cali, the second largest city in Colombia.

Box 1. Farmers and builders suck India dry, by Tara Patel

In the first week of November 1996 India's Supreme Court ordered the central government to draw up plans to regulate the use of groundwater. The ruling came after a case brought in by an environmental lawyer who warned that the lack of regulation was causing groundwater levels to fall dramatically and wells to dry up. As a result hundreds of thousands of people go short of water while the government pumps millions of Rupees into rural water supply development. A study, for which the court had commissioned NEERI, the National Environmental Engineering Research Institute confirmed that in some regions groundwater levels are falling at an alarming rate. In parts of Delhi, Punjab, Haryana, Rajastan and Gujarat drops are between 2 and 4 metres in recent years.

The lawyer brought the case to court because in most regions there are no laws controlling the number of wells or their depth. Three years ago the previous government produced a draft bill that would have tightened controls over the use of groundwater. But its passage through parliament was blocked, allegedly through obstruction from rich people, contractors and farmers' lobbies. Only a few states in India have taken steps to control the construction of wells. But even these measures have not been able to prevent affluent farmers, builders and industrialists from constructing wells in critical areas, says the NEERI. It makes a series of recommendations for tighter controls. Meanwhile in Delhi, a recent report by the Ministry of Water Resources found that not only were groundwater levels dropping, but the water was also becoming badly polluted. In some areas of the city the concentration of nitrates in groundwater is around 1 gram per litre - 10 times the permitted level for drinking water. *New Scientist, Issue 47, November 1996.*

According to the 1995 *Human Development Report*, development, if not engendered, is endangered (UNDP, 1995). But while gender is important, differences between men and women cannot be separated from other social differences, notably those in marital status, class and income. Domestic water projects clearly illustrate such differential benefits for different classes and age groups of women and men.

Age and marital status

Within the family, cultural factors, such as seclusion, household composition, and division of labour influence the division of water collection work. Girls become involved in this activity at an early age, depending on the workload and mobility of their mothers. Men

collect water mainly for business, and with transport (Wijk, 1985 and Figure 1). In polygamous households, the more strenuous tasks tend to be delegated to younger women (Boserup, 1970). This is also the case in extended families, where the heaviest workload falls to the daughter-in-law (Abdullah and Zeidenstein, 1982; Evers, 1981; Stanbury, 1981). But with time, these women will also have daughters and daughters-in-law, and become the honoured matron known as 'she who gets her water fetched in her old age' (Laurentin, 1963).

Figure 1. Division of labour in water collection: men collect water with means of transport for business purposes, women collect water on foot for the family (WHO photo by A.S. Kotchar)

Single women and men are in the most difficult position, especially the elderly and women heads of household who have no help from older children or relatives. Hence they benefit most from improved services. However, these distinctions can be mitigated by economic factors.

Box 2. Different stakeholder interests in the river catchment area of Felidia, Valle, Colombia

The small town of Felidia in Valle Province, Colombia uses a mountain stream as the source for its piped gravity water supply system. To treat the surface water the community has installed a multi-stage biological treatment system. The catchment area of the mountain stream is used for forestry and irrigated agriculture, for which fertilisers and pesticides are used. There are also some fishponds, which are filled with streamwater.

The area is the home of some 100 families. These use the same stream for drinking water, tapping into it with either individual gravity systems or small group systems. They are not connected to the main gravity supply, as this would involve pumping. The catchment area is further becoming popular with the city population of Cali (2 million inhabitants) for open-air recreation during the weekends. Wealthy inhabitants also build summerhouses in the township.

The water and land use patterns of these different interest groups affect both the quality and the quantity of the water. The houses in the catchment area have latrines and pigsties draining directly into the river area. Soil erosion from land clearing for forestry and agriculture has increased the turbidity of the water to such an extend that the treatment system gets clogged. It is increasingly difficult to deal with the chemical and bacteriological pollution. Especially the women in the town have problems with the poor quality of the water. The households in the catchment area are however not willing to change as this would affect their livelihood and they would not benefit directly from the change. Nor does the availability of water keep tread with the demand in the town. The rich summerhouse owners use much water, as many houses have a swimming pool. Being the biggest beneficiaries of the flat water rate, they have so far resisted all attempts by the original population of the town, united in the local water board to change the tariff system. In this they are helped by their strong economic and political ties to those in power in the city. The ones most affected are the women of the common town households who initiated and built the supply. Their water is inadequate in quantity and quality because other than the weekend visitors they need water seven days a week and have no large reservoirs for storage and sedimentation and because the low tariff does not allow the capacity of the scheme to be enlarged. Efforts have now started to seek compromises through a more integrated watershed management in which all interest groups are involved
(Wijk et al., 1996: 96).

Economic status

Differences between wealthy and poor households permeate all aspects of life and affect the type and amount of work and the benefits from an improved water supply. In poor families, both men and women have to work (Senders, 1983; Souza, ca. 1997; Spindel, 1981). This, together with the fact that they or their children have to fetch all their water themselves and have less utensils for water storage, explains why poor women in rural Java, Indonesia, spent less time on household tasks than wealthier women. A study in two communities in Tamil Nadu, India, found that poor women worked most of the day at paid

labour outside their houses, and thus had less time for water collection and hygiene. ‘In the harijan area, the streets are littered with children's faeces. One reason for this is, perhaps, that all the harijan women work long hours away from their houses and have much less time for their children than the other village women’ (Chauhan and Gopalakrishnan, 1983: 23). A close and reliable water supply gives these households more time to work and a chance for better hygiene. At the same time, poor rural women obtain paid work for short periods of the year, in peak periods of agricultural labour (Mankuprawira, 1981; Reining, 1979; Stanbury, 1981). Their chances to use timegains productively are thus not spread equally over the year.

In middle and higher-class households the presence of cheap labour enables the men to earn the family’s income, while their wives stay at home. However, often these women work longer hours in their households, because they have more utensils and clothes to wash, animals to tend and land labourers for whom food and drink is prepared as part of their wages. Servants and private water supplies allow these families to reduce tedious and non-prestigious water related tasks (Jakobsen et al., 1971; Pala, 1980; Sajogyo, 1978; Schenk, 1982). Many wealthier families have their own water resources (Mankuprawira, 1981). In Coimbatore in India women with house connections in higher income groups use almost twice as much water as women in other income groups, yet pay the same flat rate (Bergh and Nordberg, 1996). A study in Laguna, the Philippines, found that ownership of private water supplies was significantly higher in higher income households. The women in these households spent only eight minutes per day collecting water, as compared with 30 minutes by other women. In several upland villages, the water supply was so far away that many could bathe only once or twice a week (Popkin, 1978).

Women in middle class households have better opportunities for the economic use of water and waste. In Vietnamese land reforms the land was shared between all able families and within the family also, land was allocated to women. Yet wealthier households got more land and so better prospects because they had more labour, no debts and could afford to pay the land tax. The women had to work harder, at the expense of childcare, women’s meetings and leadership, but also earned more and had a more equal say in household decisions (Hitchcox, 1992). In Cajamanca, Peru, and in southern Colombia, women from wealthier households spent more time on economic activities, in animal care (Deere and Leon, 1980) and catering for farm labourers who were partly paid in meals (Senders, 1983). From her study in Tamil Nadu, India, Heyink (1989) concludes that the two extreme classes of women (upper middle class and poorest women) benefit economically from an improved water supply, but that opportunity costs warrant the extra expenditure in tariffs, when women have economic opportunities. Time-budget studies in villages in rural districts of Dodoma, Tanzania (Kirimbai, 1981), and New Delhi, India (Chawdhari and Sharma, 1961) also found that women in wealthier households worked more hours on income-generating activities related to water and sanitation. Under such circumstances, these women and their families will benefit most from the economic use of timesavings and increased availability of water.

1.3 A framework for gender analysis

In its broadest sense the water sector includes domestic water supply and sanitation, irrigation, wetlands management, drainage and flood control, hydro-electric power generation, navigation and pollution prevention (Sida, 1994). When dealing with gender the main issues are how work, control and benefits are divided between women and men of different classes and age groups.

For the formulation, assessment and review of policies, projects and programmes and documents, such as the present literature review, the following six questions may form the basis for the analysis of gender in water resources development and management:

1. How are men and women using the resource and for what purpose(s)?
2. How are contributions (labour, time, payments, and contributions in kind) to the development and management of water resources divided between men and women?
3. Who makes the decisions and controls their implementation, at the various levels?
4. Who gets the project or programme resources, such as jobs and training?
5. To whom go the benefits and the control over these benefits, such as status, water, products produced with this water, income resulting from products and functions and decisions on how this income is used?
6. How is the division of these attributes among women and among men of different wealth, age, and religious and ethic divisions? In other words: do some women and men benefit more than others?

Indicators for developing and assessing such a gender approach are the division, between men and women, rich and poor, of the access to information; the contributions to implementation and management; the decision-making power; the share in project resources and benefits; and the control over these benefits (Figure 2).

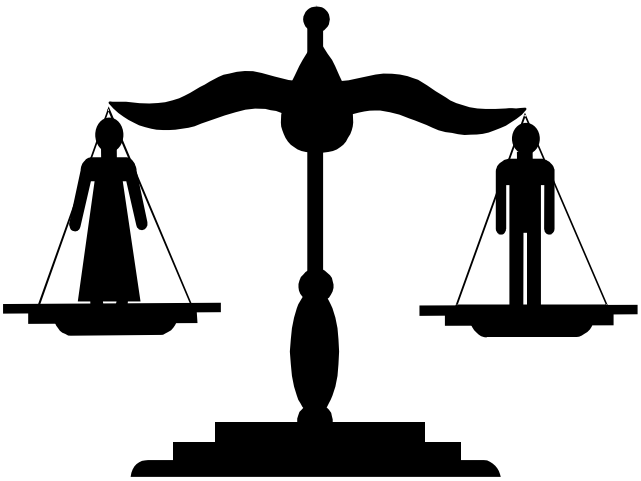

Figure 2. Framework for gender analysis and approach

A gender approach analyses current gender divisions and strives for a more balanced division between men and women of different ages, marital and socio-economic status in terms of:

- the access to information
- the amount of physical work
- the division of contributions in time and cash
- the degree of decision making
- the access to resources and benefits: water, training, jobs, income
- the control over these resources and benefits.

The application of a gender approach within an overall poverty alleviation context means that men and women in the various social categories and economic classes share more equally the work and payments, decisions and control over decisions. It means that both obtain more equitable access to resources and benefits and control over the use of benefits, without some groups benefiting disproportionally and others being marginalized or excluded. Figure 2 with its inherent notion of social and economic justice in sharing the burdens and benefits, forms the underlying concept of the subsequent chapters of this book.

2. The New Policy Consensus and its Gender Aspects

In the light of rapid changes, the use and misuse of water resources is a permanent topic on international agendas. This is resulting in the development of a common view among national governments and international organizations, at least in these fora, on what constitutes the best water resources policy. Although women are separately mentioned in all these policies, the principles themselves have not been made gender-specific. This is attempted in this chapter, based on the work of a working group initiated by the Swedish International Development Cooperation Agency (Sida) on behalf of the Women and Development Group cooperating in the OECD/DAC. Subsequent chapters review the operationalization of these principles in the drinking water supply and sanitation sector.

2.1 Principles of an emerging international policy on water management

The efforts of men and women to better control their water situation are as old as mankind itself. The ability to carry water, using large egg shells, gourds or simply by taking along a succulent melon, greatly increased the range of the gathering and hunting of the first women and men who lived near what is now Lake Turkana in Kenya. Transportable water may also be why people could migrate from Africa to Asia and Europe across the arid landstrip that joins the three continents.

There are also indications that the first people in East Africa settled near large sand rivers where wells could be dug. It remains speculation whether they used these sites and wells in the dry season and moved to higher grounds when the rains came, or took to migratory food gathering and hunting when the rains filled temporary water holes. In home bases that were occupied for longer periods, excavations reveal that these early humans made systematic efforts to clear away the litter to what constitute the first rubbish tips (Leakey and Lewin, 1977). Whether this was arranged for by women, men or both, it is not possible to tell, although gender analysis of the hunters and gatherers who still exist in the region may give an - inconclusive - indication.

While the challenge of reliable water management in all its aspects remains, the urgency of corrective action has increased. Demographic pressures, over-exploitation of groundwater and pollution increase the stress on the quantity and quality of water (OECD/DAC, 1994). Water resources, or ‘freshwater in the broad sense as available for use and susceptible to human interventions’ (Nordic Freshwater Initiative, 1992) are ... ‘finite and vulnerable’, yet.... ‘essential to sustain life, development and the environment’ (WMO, 1992). To preserve and protect this essential resource there is general agreement that better management is required both across and within all the sectors that make use of and influence this precious resource.

The range of sectors which depend on, use, share and influence freshwater is wide: irrigated agriculture, mining and industries, urban water supply and sanitation, rural water supply and sanitation, recreation and nature preservation, hydropower, fisheries. The time is past when each of these sectors could do what it liked with water resources and with land use affecting these resources, since any action has repercussions, not only within each sector itself, but also in other sectors. Thus, integrated water resources management is called for. At the Nordic Freshwater Initiative this was defined as follows:

> 'Integrated water resources management means management of water resources as regards their development, use and protection and considering all sectors and institutions which use and affect water resources' (Nordic Freshwater Initiative, 1992).

How can water resources be managed better by all the sectors involved? In the Dublin Statement on Water and the Environment, the participants of the international conference agreed on four guiding principles on integrated water resources management:

- Holistic approach: 'Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer'.

- Participatory, decentralized approach: 'Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels. Decisions are taken at the lowest appropriate level with full public consultation and involvement of the users in the planning and implementation of water projects'.

- Water as an economic good: 'Water has an economic value in all its competing uses and should be recognized as an economic good. Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price'.

- Efficient and equitable allocation: 'As demand grows and resources diminish, priorities have to be established which balance health improvement, desires for food security, environmental protection and economic growth. The economic, social and environmental priorities to be established should take into account the availability and long-term sustainability of water resources, ensuring as a top priority, the availability of sufficient, affordable domestic supplies, providing for meeting the basic needs of the very poor, particularly during droughts. Charging for water is essential and the full cost of any subsidies (including opportunity cost) should be public knowledge'.

These principles were further detailed during the 661st meeting of the Development Assistance Committee of the Organisation for Economic Cooperation and Development,

which was devoted to water resources management. Called ‘the new policy consensus’, the consensus combines the principles formulated at Dublin and Rio, the World Bank policy statement on water resources and new elements in some donor programmes in the sector (OECD/DAC, 1994).

The new policy consensus builds on several interrelated and interdependent components:

- a coherent approach to water resources with demand as the driving force;
- water treated as an economic good, but covering basic needs at an affordable cost;
- a fragmented water sector acting in unity, with river basins as natural settings;
- central governments no longer implement but enable;
- participation of users, including in decision making, at all levels and a greater role for private finance and management.

2.2 Gender in the international fora on water resources management

How do gender aspects feature in the considerations which have led to the formulation of the emerging new policy consensus? In New Delhi, where results and follow-up of the International Drinking Water Supply and Sanitation Decade (1981-1990) were discussed, water resources were one of the subject areas which emerged as essential for the next generation. In the Global Consultation’s background paper, the organizers point to the importance of preserving and protecting freshwater resources. At the same time they warn that water supply and sanitation services should continue to be expanded, so that water supply and sanitation are not reserved for the happy few, but all people have at least a basic service which covers their minimum needs (United Nations, 1990).

2.2.1 New Delhi

In the New Delhi document no mention is made of gender, but women are mentioned several times. In relation to water management the authors call attention to the phenomenon that, while the household is the level at which better water supply and sanitation are aimed, projects and programmes usually have the community as their lowest level of analysis and work.

As part of water resources management the document calls attention to the household level and to the roles of women, but only in a domestic capacity, as managers of the domestic water collection and waste disposal and as educators of the children. Women’s indigenous public roles remain unmentioned, as also are the responsibilities of men and the male-female relationships which co-determine water and waste management. The document recognizes that too little is known about water management within the household: ‘Very little is known about the daily lives of women, how they make choices, and what influences them’ (United Nations, 1990).

Environmentally, women are portrayed as the ones whose behaviour in firewood collection and waste disposal has to change to reduce environmental damage. Such women-blaming leaves unaddressed the reasons why women undertake these environmental practices: they would not collect firewood or throw waste if they had access to better alternatives. Nor does it address any male roles in such damage at micro and macro levels, e.g. through grazing, charcoal production, land clearance for settlement and agriculture, and mining.

Women's productive roles and the need for public participation get mentioned as part of the community management of water supply and sanitation services. Water collection by women is stressed to be productive labour, which has an economic value. Where labour validation of water collection takes place, the internal rate of return can be as much as 14 percent, making it possible for a water supply project to compete for funds as part of the productive economy. The authors conclude, 'if more of a marketing approach to the sector were adopted, the focus would concentrate on the reason why the service is in demand.... The centre of demand is the key, and in the water sector that key is the woman of the household' (United Nations, 1990: 26).

Community participation and community management of decentralized services are reported to be essential for a more sustainable and effective water supply and sanitation sector, but are not yet related to local use of freshwater for other purposes. Community or user organizations, which manage public water supply and sanitation services and take part in their planning and establishment, should represent all local stakeholders: 'In particular, women should be represented in such a way that they can influence project design and implementation and have the opportunity to gain management and leadership experience' (United Nations, 1990: 27).

While it is laudable to ask for women to take part in decision making and management of public services, the statement says nothing about the gender basis of old and new water systems. Such a gender basis is not new. As will be shown in the next chapter, both women and men often play public and private roles in decision making and the indigenous management of water and waste. And in modern systems it is the equitable share of women and men from different classes and user categories that is required for a well-balanced service, not the 'representation of women in general'.

2.2.2 Dublin and Rio de Janeiro

The singling out of women's roles in water resources management without paying attention to the roles of males and the interlinkages and balance between male and female rights, responsibilities and opportunities, is also evident in the reports from Dublin and Rio. The Dublin statement mentions the central role of women in the provision, management and safeguarding of water. It calls for the pivotal role of women as providers and users of water and guardians of the living environment to be reflected in institutional arrangements for the development and management of water resources (WMO, 1992).

In Agenda 21, the Rio agreement, Chapter 18 is devoted to the protection of the quality and supply of freshwater resources. It stresses the multi-sector interest in the utilization of water resources and the mutual impacts that action in one sector can have on water availability, use and quality in other sectors. Whose activities these are, what the impacts are and on whom are not mentioned.

Chapter 18 contains seven programme areas for action in the 21st century: integrated water resources development and management in itself; water resources assessment, or the collection of data needed for better integrated water resources development and management; the protection of water resources, water quality and aquatic ecosystems; the supply of drinking water and sanitation; water for sustainable urban development; water for sustainable food production and rural development and the impacts of climatic change on water resources. Women feature in four of the seven programme areas: integrated water resources development and management; drinking water supply and sanitation; urban development and food production and rural development. They are not mentioned in relation to water resources assessment, water quality protection and climatic change.

The sections on water resources assessment and water quality protection have a narrow focus and a strong technical bias. More and better data collection systems, more research and development programmes and better institutional frameworks are recommended to better forecast and manage droughts and floods and enable better integrated management and development of water resources. Attention for the social and economic factors underlying the changes in the water resources status is conspicuously absent in the recommendations for data collection and use. Authors such as Vandana Shiva (1985, 1988) and Jan Lundqvist (1994) have pointed out that it is human actions which influence the changes in water resources situations. They stress that the collection of data is not only a technical exercise but should include information on socio-economic factors and how these affect environmental conditions. Shiva demonstrates that many of these socio-economic factors have a strong gender and macro-economic bias.

The section on water quality has an extensive list of what actions cause deterioration of water catchment areas, water quality and aquatic ecosystems (United Nations, 1992: 172). Whose actions these are, and who gains or loses from them remain unaddressed.

In all the above-mentioned conference reports, where women are mentioned the messages are the same: women should be involved in water management and in training. This is introduced as something new. Attention is called to sound traditional and indigenous technologies and practices for providing all people with better drinking water and sanitation and preventing and controlling water pollution, but this is done in a gender-neutral manner. (United Nations, 1992: 166, 173). Separate roles for men and women in managing water and land use, which exist, for example, in domestic water supply in East Africa, Sri Lanka and Burkina Faso (Wijk, 1985); in rainfed and irrigated agriculture (Bissiliat and Rambaud, 1982; Brain, 1976; Hitchcox, 1992; Koppen, 1990; Palmer et al., 1983) and in small scale fisheries (Matiza, 1994; Sida, 1995), go unnoticed. New roles for

women in management and training are also not related to changed roles for men and to implications for male-female dominance.

2.2.3 Noordwijk and Paris

The Noordwijk conference and the OECD/DAC meeting which followed the Dublin and Rio conferences on water and water resources management also stress the more equitable involvement of women in decision making, management bodies and training. The Noordwijk political statement and action plan declares that '... water and sanitation programmes need to be based on partnerships involving all stakeholders (users - especially women, community associations, local, regional and central government, public and private sector agencies, non-governmental organizations)' (VROM, 1994a: 1). In the action plan the participating governments pledged to '... improve partnership and participation and therefore ... involve local communities, user organizations, women and non-governmental organizations in the planning of, and decision-making procedures about those systems'. They also recommended '...developing plans to build up the capacity of all stakeholders, including empowerment of communities, in particular the women, through proper training and education at community level.....' (VROM, 1994b:1).

Most of the statement of the Noordwijk conference gives the undifferentiated community or household as the lowest level of water resources development and management, and singles out women's shares in isolation from the contributions and responsibilities of men and changes in male-female relations. But two statements recognize that communities and households do not have homogenous sets of interests, needs and knowledge. Therefore different interest groups in terms of age, sex and socio-economic status must be identified and given a proper say in local decisions and management:

> 'We must give special attention to ... creating partnerships among all (emphasis CvW) stakeholders, which reflect the different needs of men, women and youth and involve all sections of society in resolving the problems that affect them' (VROM, 1994a: 4);
>
> And 'enhance, based on a proper gender analysis, the role of women in planning, management and operation and increase the active involvement of women in decision making about water and environmental sanitation issues at the micro and macro level' (VROM, 1994b: 7).

The participation of all stakeholders in policy formulation and the development of efficient and accountable sector organizations was one of the five principles for the new policy consensus on water resources identified by the OECD/DAC conference in Paris. A unified and cross-sector approach in the development and management of water resources requires that all stakeholders are involved and that the differences in roles, needs and rights are to be generally understood. Stakeholders do not only include the higher and lower level authorities and the water companies, industrial users and male farmers, but

'include the landless, the poor, women and indigenous people' (OECD, 1994: 6). These groups have their own specific water and water-related land use, and their needs and interests tend either to be left out completely or taken as being represented by those in authority.

The conference further stated that involving women first requires gender desegregation, so that the particular roles, needs and rights of women can be distinguished from those of men and become more visible to policy makers and planners. It recommends making gender-sensitive inventories of all user groups and their roles, responsibilities and rights a standard procedure in all water resources development and management actions.

More insights into gender, class and ethnic or religious divisions make it possible to consult, plan and manage water resources more effectively and with a better developmental impact. Gender and class-sensitive analysis will also reveal gender and class inequalities in current legal frameworks, such as land and water rights and membership and voting rights of water user associations, and in sector policies.

2.2.4 From women to gender

From the above it can be seen that, in international fora on water resources, increasing attention is being paid to gender aspects. The attention is slowly shifting from singling out women in their predominantly domestic functions to bringing up the share of power (but not yet: work) in water planning and management and institutions between women and men. Regarding the respective water resources sectors, the attention is still very much on the drinking water and sanitation sector. Gender in urban development and agriculture, livestock and fisheries receives less attention, even though compelling evidence exists that, like men, women have certain productive roles in these fields.

More recent statements attack the myth of homogeneity among women and men. In all societies, women and men of different socio-economic and cultural categories have different needs, interests and means in the use, development and management of freshwater resources. Hence, principles for integrated water resources development and management need to be specified according to the interests which such categories have, the roles they do and should play and the impacts which changes in water use and management have on them. In other words, each principle has to be understood in the context of what it means for poor and less poor men and women with different ages, economic roles and ethnic and religious backgrounds.

2.3 New policy principles made gender specific

A common water policy is emerging, but the principles of this policy are still couched in general terms and gender is not a part of them. In the reports of these fora, the recommendations are mainly concerned with collecting more information in order to arrive at a more gender-sensitive and discerning formulation in the near future. In preparation for the OECD/DAC conference, Sida brought together a group of international gender

specialists which prepared a framework for such a gender perspective in the 'new policy consensus' on water resources development and management (Lunoe et al., 1994). The discussion of the five principles of the new policy consensus below is partly derived from this framework and partly based on the author's own work and review of the work of others. Table 1 gives a summary of the framework's main points.

2.3.1 Gender, demand and demand management

At present, water resources development and management are fragmented over many sectors. Each sector develops its own infrastructure and management system, often with different management principles and legal frameworks. Interdependencies between agencies, jurisdictions and sectors exist, but are not recognized and taken into account. National policy frameworks and strategies are the first steps to bring coherence in this chaos (OECD, 1994).

Water is a limited and vulnerable good. Therefore, water should not be supplied unlimitedly, but be limited to the amounts for which there is an 'economic' demand. Also, efforts should be made to manage that demand, to make sure that no more water is used than can be afforded in view of total availability and renewability, and that the water which is used, is used to the best advantage and does not go to waste.

As discussed in some detail in the sections below, the principles of a coherent and demand-based approach can be made gender specific by taking into account that:

- men and women in different socio-economic classes and societies have different demands for different water uses;
- the importance of these demands is properly valued;
- tools used to regulate demand will affect men and women in different income groups differently;
- men and women in different socio-economic classes can express their demands and see them honoured.

Different demands

If water resources management and supply are increasingly based on economic demand, what is economic demand, and whose demand is it? Many agencies still look upon communities and household as the lowest and homogeneous unit of decision making (Figure 3).

Table 1. Current principles on water resources management and their gender aspects

Principle	***Rationale***	***Gender aspects***
Demand-responsive projects; demand management	Governments that provide free services cannot maintain them. Users are better off with a service that satisfies them *and* is affordable *and* does not deplete water resources. Demands on amounts of freshwater, for water supply, sanitation, agriculture, livestock, industries, etc. are manageable by price and charging policies, rationing water, reducing unaccounted for water, and public education.	Women and men have different demands for water and water-related services. A gender and class specific analysis of demands is required. Increased pricing should not reduce water consumption for cooking and hygiene. Tools of pricing and rationing miss their purpose when not compensated for by reliable and predictable services in recognition that women manage time as much as men. Campaigns to reduce water wastage need to target women and men, as either group wastes water. More attention to pollution control benefits water resources and women, who collect domestic water, deal with health and suffer from poor sanitation.
Water being an economic good	Freshwater is limited. Its transfer costs money. Its use for disposing waste causes damage, which also costs money. Those using freshwater should therefore pay. Having to pay will limit use and pollution.	In valuing freshwater, domestic and productive water uses of women are overlooked/underrated. Their rights to water and land have social and economic benefits. Water development may affect negatively the livelihood of poor women and men. Within households, men, women or both may pay charges. Charges paid by women often press harder on them as their incomes are smaller.
Holistic approach to water management	Holistic management is needed because development and management actions taken in one water resources sector have an impact on water availability, quantity and quality in other water resources sectors.	Impacts do not stop at the household level, but affect members of households differently, according to their sex, age and position. Different types of users can also contribute differently to overall water management.
Government roles shift from provider to enabler	Governments should not take upon themselves the full implementation of services. This is done more efficiently and effectively by those who have a direct stake (use and profit) in providing the service. Government's roles remain essential in providing the environment, monitoring achievements and controlling and preventing abuse. As enablers, governments' responsibility for capacity building becomes more important.	In enabling and monitoring governments have a particular responsibility to protect the interests of the groups that the profit-seeking sectors will not consider, such as low-income households, domestic water users and those who use water sources and water catchment areas for the first necessities of life. Women are heavily represented in these categories. Capacity building should benefit women and men equally and prepare women to represent economic and social interests overlooked in water resources development/management.
Stakeholders participation; civic partnership	A greater participation of social and economic stakeholders leads to better water management. Management should represent all interests to ensure that in given conditions and considering future impacts the best choices are made. It should be at the lowest appropriate level to ensure that decisions are supported by those who implement them.	Women's traditional roles in water resources management are underexposed and underrated. In new management systems, women are underrepresented at the levels where decisions are made that affect also their lives and livelihood. Greater participation of women in management should not lead to more work and responsibilities for women and exempt or bypass men, but equitably distribute benefits and burdens between the sexes.

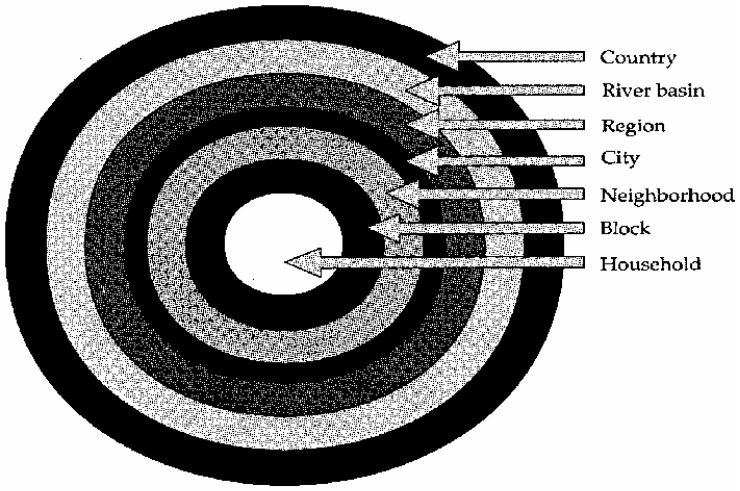

Figure 3. Levels of decision making: but who decides and influences decisions within neighbourhoods and households? (Source: Serageldin, 1994)

Within communities, groups differ in the kind of services or facilities they would like to have and can afford (economic demand). And within the households in these groups, men may want to spend resources on other services or products or designs of products than women. Nor is it always the men who decide. In some cultures, decisions are made jointly and the women's views and needs have as great an influence as the men's (Rogers, 1980). Or women have their own resources, individually or as a group, which they use, for example, to get their own lift irrigation (Povel, 1990), dams (Soon, 1983) rainwater tanks (Wacker, 1990) or water for brewing (Nelson, 1980). Where men control investments, women have found ways to get them finance their demands (Wijk, 1985). On the other hand, those who have no benefits will have a low demand and will not easily contribute. Women and youth were reluctant to take part in the construction and maintenance of infiltration dams in a land and soil conservation programme in Burkina Faso. The young men had no rights to use land below the dam; the women had to ask their husbands and lost income from trade during construction (Vlaar and Brasseur, 1992).

In a strategy based on economic demands, agencies thus cannot confine themselves to offering one standard option to all households through the male head of the family. Feasibility studies and marketing research will have to be based on a cross-section of the population, by class, sex and other important characteristics, and a wider range of options needs to be offered to women and men. Nor can it be assumed that by asking and addressing men, women will also be reached, since it will be shown in Chapter 3 that topics and channels of communication are often gender-specific.

Valuation

Economic demand for what? In looking at the uses of water, its use by women is often not given an economic value. This is the case for domestic water supply, where water

collection by women and children is seen as domestic labour. The economic implications and costs of this work - in terms of lower food production, worse childcare, nutrition, hygiene and health, decreased participation in education and a lower labour quality - are seldom taken into account when giving a value to water. This has consequences particularly for poor women, who have no means to adjust.

In Maharashtra and Andhra Pradesh, for example, the use of groundwater for irrigated cash crops has brought many economic benefits to the families concerned. The womenfolk of landowners with irrigation pumps are able to use this water also for domestic purposes. Poor women found that their domestic shallow wells fell dry (Baldwin and Bhatnagar, 1996; Gandhigram Rural Institute, 1994; Rao, 1991) and they have become dependent on better-off farmers to use more distant irrigation wells for domestic purposes.

But women also use water *productively*, in domestic industries such as brewing and food production (Nelson, 1980; Rogers, 1980; Wijk, 1985), crop growing and livestock production (Boserup, 1970) and fishing (Matiza, 1994; Sida, 1995). Economic use is particularly practised by medium and lower income women and is of significant importance to them and their families. Such uses often go unrecognized and are not reflected in demand inventories and systems operation and demand management. In the resulting scarcity, the women have to compete with others for limited resources. Although in Banaskantha, a drought-prone area in Gujarat, India, the water supply was designed for also watering cattle, poor women who keep 1-2 milk cattle for income generation could be seen struggling with other users to get the last drops of water for their animals when the water flow stopped due to rationing by the Gujarat Water Supply and Sewerage Board.

When the economic use of water and land is properly valued it would stand a greater chance of being included in the design of water projects. Cox and Annis (1982) report a case in Guatemala in an area where small-scale irrigated strawberry production was a profit-making enterprise. Had the domestic water supply from the start been designed for combined use with irrigation, the total cost could have been covered from the profit generated from this crop. Strict regulations did not allow such a combined use and so the scheme was built, but not used, for drinking water only and competition between two important water uses was the result.

Failure to design for multi-sector water use can enhance gender-based competition, in which the women usually lose out. In Nalgonda in Andhra Pradesh in India, where high fluoride content in traditional wells has a negative impact on human and animal health alike, male cattle owners chased away women who were collecting fluoride-free drinking water from piped systems not designed for livestock purposes (author’s personal experience). Similar competition for water for humans and cattle or irrigation is reported in Shinyanga, Tanzania (Boesveld, 1994). In Gujarat, India, Schenk (undated) reports how male leaders decided to use water meant for domestic use for irrigation. As a result women had to return to the contaminated village pond. Schenk comments: ‘this is an obvious example of patriarchal power relations ... in which a new implemented technology is not of

any benefit to the women, because they have no decision-making power over it' (p. 17). Case studies in irrigated agriculture show that neglect of women's water and land use for domestic and productive purposes resulted in wrong plans and design and unwanted negative socio-economic impacts later on (Carney, 1988; Dey, 1990; Hanger and Moris, 1973; Jones, 1986; Zwarteveen, 1995).

In contrast, recognition of male and female water and land use resulted in the use of irrigation systems by men and women in Orissa, Nepal and Burkina Faso (Dalwai, 1997; Martin and Yoder, 1982; Zwarteveen, 1995, 1997). In Burkina Faso, this resulted in higher land and labour productivity. Women's work increased, but so did their income. It has been estimated that 95 percent of irrigation systems are in practice also used for domestic water supply (Wijk, 1985: 32). A number of irrigation programmes take such use into account. Seepage of water from unlined canals, for example, has raised the water-table and handpumps have been installed along the water source to draw safe water for drinking in schemes in southern Asia (Agarwal, 1981; Jayewardene and Kilkelly, 1983; Palmer et al., 1983) and in Africa (Pacey, 1977). In Sri Lanka, the Gal Oya project issued domestic water for three days out of ten when canals are normally dry. In a scheme in the Philippines, a small diameter pipe system was added to the irrigation network to provide easy access to a limited amount of extra water for domestic use (Yoder, 1981).

Demand management

Tools used to regulate and reduce water demands include pricing (usually in connection with metering), rationing, reduction of unaccounted for water, technical measures to reduce water loss and public education (World Bank, 1993). Each of these tools may have different consequences for men and women of different socio-economic levels.

Water consumption measurement and price increase are important regulating tools to decrease water consumption. However they have the risk that lower income groups are excluded from basic water services. Single women heads of households are an important category in these groups, especially in urban areas. Another risk is that it forces poorer women to reduce certain water uses, for example, domestic water use for hygiene. In a study in the United Kingdom, Cunninghame and Laws (1996) found that 70 percent of the low-income families interviewed in the outer London area had cut their water bill by reducing use for hygiene. Colleagues working in water supply in Asia, Africa and Latin America voiced their concerns about the effect of water metering on hygiene habits. Metering is also costly for low-income households: in United Kingdom it accounts for 15 percent of the water bill. Cross subsidies and metering for communities and groups rather than households (Kwaule, 1985) have the benefits of reducing the cost for poor households while still managing demand.

Rationing tends to have differential impacts. In linear systems it can hit those in the weakest position hardest. These are poor men and women living at the tail end of water systems and women who use water for unrecognized uses, such as women's crops and

domestic milk production, and lose out in competition with more powerful economic interests.

Rationing of water without informing the women on the rationing schedules shows a lack of respect for its users, as it assumes that women do not manage their time. This practice does not just inconvenience the women, but also has negative socio-economic impacts where women have to manage their time economically. In Banaskantha in Gujarat, in India, the Self-Employed Women's Association helped the women form production co-operatives when a water scheme brought more water and more time for productive activities. Not knowing when the rationed water will flow and not wishing to reduce their income, these women now send their young daughters and sons to stand watch at the taps until water comes, thus depriving them of the chance to attend school.

Unaccounted for water. Reducing unaccounted for water usually includes cutting off illegal connections. Here again it is useful to look at the differential effects. In rural areas, such illegal connections may well be those of wealthier households. These often use more water than the capacity of the scheme is designed for and rarely pay the real price.

In urban areas the policy often hits people in slum areas. However, the design of many urban water supplies is such that the households concerned often have no realistic alternative. On the one hand, private house connections are not provided in these areas and are too expensive. On the other hand, public standposts are few and far between and mean high social and economic costs from long waiting times and water-carrying over long distances, while water bought from vendors is contaminated and costly (Adrianza and Graham, 1974; Zaroff and Okun, 1984). Where design is demand based and realistic alternatives are given, such as in water supply in Malawi and sewerage in Karachi, Pakistan, economic demand has emerged and is met (IRC, 1991).

Demand-based systems which serve everyone and in which water is not wasted, require the responsible institutions to investigate the economic demands of all user categories - men and women in all income categories and settlements who use water for all purposes. It also requires that they offer ranges of options, design criteria and administrative arrangements that can meet those demands, and that users have the mechanisms to ensure that the service for which they pay is actually delivered.

Water wastage does not only come from too cheap water. Faulty design criteria on water amounts and uses and the design and location of facilities can lead to unnecessary wastage. Such faults can be prevented when different user groups can take part in making informed decisions on designs. The demands of low-income users for better facilities can be met when the range of technologies and service levels offered are adapted to what low-income people want and can pay for.

Technical measures. Problems of water wastage tend to be addressed through technical measures. Such measures will frequently not work when they are based on the reality and

view of the outsider instead of the reality of the user groups. Local users have shown great ingenuity in finding ways to fix automatically closing taps, when these taps are inconvenient to use (Fritschi, 1984). A readiness to communicate and understand the situation of the users, on the other hand, can also bring other solutions than engineering ones. In the Andes mountains in Colombia, the water at the intake for a water treatment system based on slow sand filters was contaminated by cattle excreta. The engineers proposed first that the area be fenced off. The villagers pointed out that the wire would be stolen. The engineers then proposed that the villagers herd their cattle or graze them in enclosed pastures. The villagers reported that the children should go to school and that they had no suitable land, nor funds for enclosed pastures. The engineers then explained the problem and asked the villagers for a proposal. The villagers now saw the problem and suggested that the men plant a small grove of prickly vegetation not eaten by their cattle at the intake. This forced the cattle to drink downstream and the problem was solved (Wijk and Heijnen, 1981).

Public education and mobilization. Although women can often play an important role in campaigns to reduce water wastage and pollution, care should be taken that the burden is not laid one-sidedly on women. It often occurs that in rural water supply programmes, only women are made caretakers of local waterpoints, to reduce wastage and prevent pollution and report problems. The job is usually a voluntary one, which involves time and physical work, mainly of the cleaning type, and the women have no chance to climb up to higher positions.

Honouring demand

Under a supply-based approach, services are provided according to the rules and procedures of the state or the financing agency. When the users hardly pay, there is little need to investigate economic demand. With a demand-based approach this changes. As a result, users are consulted and willingness to pay studies are carried out. It is becoming more common as well that users get a greater range of options to consider, in order to match the different demand levels.

Within households it is still common that only the male heads of household are consulted in demand investigations and consultations. For some uses and facilities the women in the household will, however, have a greater need for a certain service (such as sanitation and solid waste disposal) than the men. When informed and consulted these women can greatly influence demand. Moreover, we already saw that when different uses among women and men are not distinguished, certain uses related to water resources management tend to be overlooked. This may later lead to increased competition for water and other negative consequences.

When users pay, honouring demand does not stop with the installation of the service. If the organizations, at whatever level and of whatever nature, do not deliver the service and cannot be held accountable, users have no other choice than to stop paying. Creating a system for accountability is therefore part of a demand-based approach. It is not always

the case that those with a direct interest also have the opportunity to hold the service provider accountable. Attending and voting in assemblies on domestic water supply and irrigation services, for example, may be reserved for male household heads, even though women have the most direct interest in a domestic service and women also irrigate (Cloud, 1994; Jacomé and Krol, 1994; Whitaker, undated, ca. 1993; Philippines, undated; Schmink, 1984).

2.3.3 Water as economic good: gender and payments, rights and allocation

Water as an economic good is one of the principles adopted in Dublin. This means that those who get water transported to them or discharge waste on to a watercourse should pay for the service they get or the damage they cause. Yet water is also a fundamental need and has to remain affordable for everyone. This implies that water is also a social good. The amount of water delivered for the basics of drinking, cooking, essential hygiene and production of subsistence food should remain affordable to the lowest-income households, many of whom are female-headed.

Viable payments

Water tariffs. A higher price makes for more economic water use. It also brings the risk that water is priced out of bounds for the lower income groups and that in farmer households women are no longer allowed to use water for their own production. A social tariff for the first 20-40 litres of drinking water per person per day and for the smallest scale of irrigated farming avoids an increase in poverty. It also eases the domestic tasks of poor women. In the low-income city areas of Querérator in Mexico women have a 40 percent longer workday than men, because of the lack of basic water supply and sanitation. They also pay 25 times more for water than a well-to-do household and on average spend 7 percent of the family income on it (Chant, 1984). In Onitsha, Nigeria, poor men and women will readily pay for piped water, which now serves few people because of the unrealistically low tariffs. On an annual basis these poor households now pay to vendors over twice the operation and maintenance costs of a piped system, spending an estimated 18 percent of their income on water (Whittington et al., 1991). In Ceará in Brazil, all rural users are scheduled to be charged for bulk water supply in July 1997 to reduce the high consumption in this dry state. Only the poorest farmers will not be charged for water. This includes women who use water from reservoirs for domestic purposes and small-scale production. Water in the cities is treated and all users are charged for its use. The tariff increases with use and the smaller amounts used by low-income households are heavily cross-subsidised (Kelman, personal communication).

Who pays in the household? Affordability does not stop at the household level. There are several cultures where, within the household, the spheres of women and men are segregated to a high degree. In such cultures, women will provide and pay for certain goods, men for others. Women's resources for such payments are, however, usually lower than men's. It therefore makes quite a difference who in the household has to pay for what (Wijk, 1985).

Adjusted payment system. Another financing aspect requiring adjustment to differences in gender and class is the payment system. Relating to the realities of low-income households is one of the reasons for the great success of the Grameen Bank, where many loans go to poor women and loan recovery is 98 percent (Stenvang et al., 1990). It also explains the good results of the water and sanitation utility of Santiago de Chile, where total coverage is achieved through cross-subsidisation and women can pay locally at a mobile office (Figure 4).

Low-income households can, for example, seldom pay large lump sums, such as are required for water connections, and even monthly tariffs. Allowing users to pay smaller amounts more frequently makes water more affordable for low-income families also. In several Latin American countries, the Philippines and Kerala, India, spreading connection costs over time made private connections more affordable (Figure 5) and gave more women the benefit of a tap in the house (Serageldin, 1994; Wijk, 1989). Another constraint, especially for women, is distance to where payments have to be made. Scotney (1977) found this to be one of the reasons for low payment of water tariffs in a scheme in Kenya where women made payments. The Grameen bank has been sensitive to this aspect as well and allows payments to be made to bank intermediaries in the neighbourhoods (Stenvang et al., 1990).

Water rights

When water becomes an economic good, water rights and land associated with those water rights also get an economic value. Women and men may have different rights to water and land. In traditional systems women are more likely to have right of use than right of ownership. In transferring traditional rights to modern legal forms, such as title deeds, user rights tend to be overlooked. Where women formerly had a share in the traditional rights, all legal rights have since come to rest in the hands of the men in the households and clans (Brain, 1976; Pala, 1980; Rogers, 1980). In her case studies on poverty alleviation in Burkina Faso and Bangladesh, Barbara van Koppen (1997) showed the value of investigating and preserving existing gender relations in water and land rights which support socio-economic development. In Burkina Faso, the government failed to recognize the traditional gender division in agriculture and lost the women's contribution until the fault was seen and corrected. Where such rights are absent, they can be created. In Bangladesh, landless families and women have no water rights but, helped by NGOs, have succeeded in organising and getting water rights and selling water (Box 3).

Figure 4. A mobile office brings services closer to the users (photo: EMOS S.A., Santiago de Chile) Source: World Bank, 1992

Figure 5. Spreading connection costs makes taps more affordable

whole, as reported, for example, in Tanzania (Kirimbai, 1981; Mascarenhas and Mbilinyi, 1983), Zambia and the Gambia (Rogers, 1980).

3.2.3 High incidence of water- and waste-related diseases

One of the peak periods for agricultural labour, the planting season, has been found to coincide with peaks in the incidence of diarrhoeas (Chambers et al., 1981). This is probably related to increased contamination of surface water and unprotected wells as a result of surface drainage of human excreta, and in general, to greater survival of germs when temperature and humidity are high. Other factors, such as less time to boil unsafe water, to collect water of better quality from more distant traditional sources, and to observe food and household hygiene, may also contribute to the seasonally higher incidence of these diseases.

Infants, in particular, are at risk when their mothers face conflicting economic and domestic demands and have poor nutritional status themselves (Nerlove, 1974; Chakravorty, 1975). Bottle or spoon feeding by older siblings may replace breast-feeding. Peaks in infant diarrhoea have been reported to occur in the rainy season in Bangladesh, the Gambia, Thailand and the Philippines (Wijk, 1985). In the Gambia and Bangladesh, high incidence of diarrhoea correlated significantly with the use of contaminated water and food in infant feeding.

3.2.4 Need for alternatives for communication and learning

Although water-related work is arduous, it provides women with an opportunity to meet and exchange information. Women in segregated cultures, and in areas where they are actively involved in agricultural work, have fewer opportunities to meet than men. Men often meet solely for the purpose of communication. Women tend to combine meeting and communication with their work, for instance at laundry places (Fagley, 1976). Hence alternative means for communication and learning may be needed when new water supply and waste disposal facilities at home limit women's meeting opportunities. Setting up alternatives for communication and learning can be related to female education and training and so benefit the projects, the gender balance in education and development in general.

3.3 Management of water supply and waste disposal in the home

Women not only do most of the work in water collection, but also take most of the management decisions. They decide which water sources to use for various purposes, how much water to use, and how to transport, store, and draw the water. On the other hand, men decide the location of the settlement, which has a large impact on water collection efforts (White, 1977). Social studies show that women make careful decisions about water use patterns. In their classic study, White et al. (1972) observed:

‘Nowhere did we find widespread casual or indifferent evaluations of water sources. Most users had evaluative judgements and most were interested in ways of improving their supplies. If they appeared to act contrary to the judgement of an expert it was for reasons convincing to them. The gap between the two judgements does not seem to rise from lack of motivation to gain healthful supplies; it comes from differences in information and its assessment (White et al., 1972: 239).

External projects and programmes which neglect indigenous management and treat women as beneficiaries and users, and not as water and waste managers and decision makers, thus hamper their results and diminish women’s position.

3.3.1 Selection of water sources for different uses

As managers, women do not select water sources arbitrarily. To determine which source they will use for which purpose, three types of criteria play a major role, though other factors cannot be excluded. The major criteria are: economic demands, perceived water quality and social relationships. Women also use these criteria for judging new sources. Knowledge of these criteria and understanding of the selection process are part of the design of new services, when programmes want to see new services not just established, but also used, maintained and paid for.

Economic demands
Because of their workload, women tend to prefer water sources which are reliable and from which collection requires the least time and energy. Wijk (1985) reports many studies which indicate that economic criteria are given the greatest weight.

However, this is not necessarily so for all water uses. In villages in Ethiopia, Nigeria, India, Bangladesh, Nepal, Sri Lanka, Indonesia and Thailand women select certain sources for drinking water and other sources for washing, bathing, and watering cattle (Wijk, 1985). This is also the case in Tanzania (Drangert, 1993) and Mexico (Whyte, 1976). Differentiation in water uses is increased when women have a choice of several sources at competitive distances, as for example in communities in wet highlands:

‘Three quarters of the Ethiopian women in a sample from five highland villages took water for bathing and washing from a source other than the one used for cattle consumption, laundry or bathing, while 40 percent were doing so in the dry season. In the five lowland villages only 2 percent of the households used a separate source for drinking water in the dry season’ (Kebede, 1978: 37).

Perceived water quality
There are strong indications that, in selecting sources for drinking water, women choose the nearest source of a perceived good quality, even though this may not be the nearest source of any kind. A study in a representative sample of villages in two regions in southern Tanzania showed that, in the dry zones, 11 percent of women walked to the

second nearest source because they considered the water to be of better quality (Tanzania et al., 1983). Women in south-west Burkina Faso were prepared to go further for better quality drinking water in the dry season than in the wet season, when planting and weeding were given priority (Roark, 1984). In a village in north-west Tanzania, women were prepared to walk an extra distance of 30 to 50 percent with an upper limit of about 200 metres extra (Andersson, 1984). A study in Botswana gives the acceptable increase in distance as 25 percent, but no upper limit is mentioned (Kjaer, 1980).

Reports on selection criteria for water sources in communities in East and West Africa (Wijk, 1985) and in Papua New Guinea (Feachem, 1973) show that local concepts of water quality are based mainly on sensory perceptions, such as clearness, colour, taste, and temperature. The cleansing effect of continuously flowing or upcharging water has also been found to be an important selection criterion. Other criteria are associated with magical-religious concepts, including fears of sorcery and poisoning (Feachem, 1973; Ploeg, 1979; Kelles, 1983).

The preferred domestic water source of the Raiapu Enga clan in a valley in the western highlands of Papua New Guinea was a permanent river. Criteria were its permanence, a large flow of clean, cold water and the location of the source within the clan's territory so that other clans could not poison the water. However, only those living in a marginal area between this river and another, slightly less acceptable, river were prepared to walk the extra distance to the preferred water. A third, much smaller, permanent stream was almost totally rejected because of its perceived quality, even by those living nearby (Feachem, 1973).

The logical reasoning of women with regard to source quality is illustrated by the example of a village in Tanzania:

> ‘In a discussion about possible contamination of the river water, their main source for domestic use, the women pointed out that drinking water was always collected early in the morning, before polluting activities, such as bathing and washing clothes took place. They had not considered the effect of the activities of women in villages upstream who were unknown to them. Through discussions, the group concluded that these women would do the same as they, and therefore their water in the morning would not be as clean as they had thought and that they needed an improved source after all’ (Tanzania et al., 1984).

Although selection according to sensory perceptions may well mean that women choose sources of poor bacteriological quality, their rating of sources can also be quite correct. In studies in Lesotho (Feachem et al., 1978), Tanzania (Drangert, 1993) and Papua New Guinea (Feachem, 1973), ratings of water sources by women were found to be in close agreement with the water quality as shown by bacteriological tests. In another study in Tanzania (Tanzania et al., 1974) women's perceptions and scientific measurements matched on the two extremes of the water quality scale.

The complexity of water use patterns is illustrated by investigations in two Fula villages in Guinea Bissau. In both villages, the women had a choice of several permanent water sources. Indepth study of their decision-making patterns revealed that, in general, both groups applied the same criteria of good colour, taste and flow for drinking water; a short distance for kitchen water; a steady flow and opportunities for meeting for washing water; and privacy for bathing. However, the relative weight given to these criteria differed according to local circumstances.

In the first village, two-thirds of the women gave high priority to good drinking water. They drew this water from a large pond to which they walked a distance of up to 880 metres. Water from a nearer well was used only for clothes washing and kitchen purposes. The remaining women collected water from an open well for all purposes, even though they considered this water not to be as clean as that from the pond. In this choice, however, they bypassed another closer source, because of the high iron content in the water. In the second village, the greatest effort was made for clothes washing in a river-fed pond. Women were prepared to walk 800 metres further than the nearest alternative water source. They also preferred to use this water for drinking, but were not so readily prepared to make the extra effort for this purpose.

The complexity of water use patterns in these Fula villages, in which most women also filter drinking water, and drainage arrangements and regulations on use are found, is in sharp contrast to the Balanta communities in the same region. Women in these communities use the nearest family well for all purposes, including cattle watering, and conditions are very unhygienic (Ploeg, 1979).

Efforts made by women to clarify drinking water by filtration, straining, or treatment with alum, salt or clay also indicate concern about water quality (Al Azharia, 1981; Wijk, 1985).

Social relations

The even greater complexity of the natural and social environment in Bangladesh is reflected in a village study undertaken by the Cholera Research Laboratory (Briscoe, 1981).

> ‘Throughout the year, villagers in Panipur, Bangladesh, have several sources to choose from in their direct environment. This allows women in all socio-cultural and economic categories to choose drinking water from the source of the best-perceived quality, especially in terms of odour and taste. For all other uses, nearness of source is the most important criterion. However, in the drier season preceding and following the monsoon, there is less choice and then "the poorer families tend to choose sources which are of worse quality but which are closer and at which quarrels are less likely". During the monsoon, water sources become merged, and ". . . it is now the richer groups who are prepared to go greater distances to avoid quarrels". The same is also the case for non-drinking water

uses: "… in all cases the rich are prepared to go further to get water of higher quality' (Briscoe et al., 1981: 179).

In more egalitarian communities, social conflicts as a factor in source selection are also present but are of less importance (Tanzania et al., 1982; White et al., 1972). The wealth of data makes clear that from their own perspectives, and in relation to their specific environment, women make rational choices when deciding whether or not to use a particular water source. External projects which assume that a bit of health education and other promotion will automatically bring exclusive use of, and payment for, improved water supply do not understand these realities of women's lives and management decisions.

3.3.2 Domestic recycling

The same careful and deliberate behaviour based on age-long experience and social learning is also apparent in women's domestic management of water and waste. This is particularly evident in hardship areas, such as in parts of Somalia (Roark, 1984), Sudan (Ali et al., 1981), Guatemala (Buckles, 1980), Egypt and Yemen (Fong et al., 1996) and Tamil Nadu, India (Chauhan and Gopalakrishnan, 1983). In Mahweit province, Yemen, women preserve the cleanest and freshest water (preferably from a spring) for drinking, personal washing, cooking, and washing drinking glasses, food, and flour grinding stones. Grey water is saved for washing and rinsing clothes and for watering plants. Water used for washing food is given to poultry and cattle, and water used for clothes washing is reused to clean floors and wash dishes (Ansell, 1980). Habits of recycling of waste and wastewater constitute a useful base for demand management and occur widely (Bhatt, 1995; Dalmeyer, 1988; Wijk, 1985).

3.3.3 Economic use of water

It is generally assumed that women use and manage freshwater mainly domestically, and that productive use is reserved for men (irrigated agriculture, production of goods and services, livestock keeping and breeding). However, women's economic use of water should not be underrated. In many societies, women are involved in animal care and also keep several animals themselves to market and to supplement the family diet (Wijk, 1985). The animal protein provided is essential, not only for the growth and development of small children and adolescents, but also for adults, because the protein in staple crops is usually of lower quality.

Cash income is earned from vegetable gardens, and also the produce provides a source of cheap and essential food supplements for their families (Wijk, 1985). However, it is not always clear whether women have gardens in the rainy season only, or whether they also collect extra water for these plots. In African countries, home brewing of beer can be of considerable economic importance in both rural and urban areas (Hannan, 1984), and is one of the few ways in which women heads of household have been able to earn a living for themselves and their children (Wijk, 1985).

The involvement of women in other sectors of water use, such as irrigation, animal care and fisheries, is underestimated. Gender-sensitive studies have revealed a much more active role of women in irrigated agriculture, livestock care and fisheries than has been assumed. Cases are, for example, reported in Burkina Faso (Koppen, 1990), Bangladesh (Thomas, 1994), Ecuador (Jácome and Krol, 1994), Kenya (Povel, 1990), various parts of India (Dalwai, 1997; Gopinath and Kalro, 1985; Jain, 1980; Madhavan et al., 1992; Mitra, 1983), Nepal (Bruins and Heijmans, 1993), Vietnam (Hitchcox, 1992), Zambia and Zimbabwe (Carter, 1989; Matiza, 1994).

3.3.4 Economic use of waste

South and Southeast Asia and China have long traditions of productive use of human and animal waste. In Java, Indonesia, most villages have public or private fish ponds for excreta and refuse disposal, and in some villages, human and animal waste is also used as fertiliser (Smet, 1978). Human waste is scavenged by pigs and poultry in many parts in Asia. In Latin America and Africa use of human waste that involves transport of fresh excreta is not practised, but the planting of fruit-trees in old latrine pits and selective excreta disposal in fields to increase soil fertility have been reported (Wijk, 1985).

A task common to many women in dry areas in the Middle East, Africa, and southern Asia is the processing of animal dung for household fuel or to sell (Wijk, 1985). In India, poor women who have no cattle of their own are traditionally permitted to collect dung from the cattle of wealthy landowners (Briscoe, 1978). Cow dung is also used for plastering walls and floors to keep them smooth and clean. This is usually a task of women and may vary in frequency from once or a few times a year (Copperman et al., 1978) to once a week (Schoustra, 1975) or even once a day (Bang et al., 1975).

Women also collect or sort waste as a formal or informal job. An example are the Zabaleen in Cairo, whose economy is based on waste collection and recycling determined by gender and religion. This private enterprise effectively fills a gap in the market ((Maan, 1995). As a strategy it is used in other large cities as well, for example in Recife (Arrais, 1996).

In urban areas many people may find employment in traditional types of sanitation systems. The number of night-soil collectors employed in some parts of India by municipalities alone is estimated to be between 500,000 and 650,000. Although no specific figures on the number of women employed can be found, they are well represented (Wijk, 1985). In addition, they work as private sweepers in wealthy households because the high castes prefer their womenfolk not to come into contact with male sweepers (Chatterjee, 1981). This work is done either in addition to a job with the municipality, or under the ancient patron-client relationship in which the women are paid mostly in food and cast-off clothing (Mitra, 1992).

Women formally employed in waste disposal and collection are protected by the labour regulations of the sanitation union and central government. Sometimes, as in the cities of

Varanasi and Karachi, they have obtained secure and relatively well-paid jobs and work as respected and equal partners with their husbands (Corrales et al., 1983). However, their strong economic and social position is dependent on adherence to the labour laws. Evaluations in India show that such adherence is the exception rather than the rule (Huysman, 1994; Trivedi, 1977).

Labour-intensive excreta and refuse collection systems are very common in fast growing cities. Cases are also reported in cities in Afghanistan and Colombia (Etherton, 1980), Egypt (Haynes and El Hakim, 1979), India (Huysman, 1994), Indonesia (Judd, 1995), Mexico (Schmink, 1984) and Vietnam (Bang, 1995). Exploitation occurs and is increased by middlemen who sell cleaning rights to individual households. Nevertheless, these systems, in which women and children often play an important economic role, provide a living for many poor households who have no alternative.

Both in the North and the South new gender-based systems of solid waste recycling have been built on practices whereby solid waste is separated within the household and is then separately disposed or collected for recycling as a means of income generation. In Recife, the municipalities gives women in low-income neighbourhoods food tickets or building materials for their community buildings when they sort and collect household refuse for recycling. It has also given women and men who worked as rag pickers and waste collectors in the informal sector a recognized job in solid waste collection and better and safer means for collection and sorting (Arrais, 1994, 1996). Experience with community-based solid waste collection in Abidjan and Ouagadougou learned that community-run services had the best area coverage and collection by private entrepreneurs the best cost coverage. In both types of schemes women were instrumental in initiating the service. In Abidjan also young women, called ‘amazones’ collect solid waste. A gender problem is that husbands do not always want to pay for the service, while the payment is monthly and too high to be paid as lump sums by women alone (Meyer, 1993 and personal communication). In the Netherlands, especially women in households have achieved that half of the used paper, one quarter of household biological waste, over three quarters of glass bottles and pots and half of the used batteries are segregated within the households, and separately disposed or collected for recycling by the government and the private sector. Used paper is collected by voluntary groups who sell the paper for income generation (Broek et al., 1991).

3.3.5 Value to the GNP

Because unsalaried work by women is not included in the Gross National Product (GNP), the value of their labour to the national economy is vastly underestimated (Goutier, 1995; INSTRAW, 1984). Collection of water and recycling of waste would be considered to be economic activities of high labour cost if they were replaced by paid labour (McPherson and Jackson, 1975). Green (1996) concludes:

> ‘Economics has so far almost totally failed to incorporate any of the characteristics of time. The recognition that time is a constraint on production, just as much as the factors of production, resulted in the development of operational research and it is towards operational researchers rather than economists that production managers turn for advice on how to optimise production. Equally, time might be argued to act as a constraint on consumption, just as much as income’ (Green, 1996: 217).

Other forms of productive work by women are only very slowly being recognized in the formal economy. In her paper on urban poverty, Moser (1996) refers to the total absence of data, other than NGO’s anecdotal evidence, on how the adjustment policies affected poor households. Ten years later, such data are now emerging, segregated for sex and other social and economical characteristics. In rural areas, Boserup’s and Rogers’ research showed that women are often predominant contributors to basic production. This contribution has not been referred to in national statistics and development projects have passed women by and directed agricultural innovations at men (Boserup, 1970; Rogers, 1977). Although this situation is gradually changing, reports on women’s share in production and their involvement in development projects still come predominantly from female researchers (Sida, 1995: 10) and all statistics are not yet routinely segregated for women and men. This indicates that gender has not yet been clearly identified in the overall set of variables for development and development research.

3.4 Water resources management in the public domain

3.4.1 Management of local learning systems

In every community, there are learning systems by which local knowledge is adapted in the light of new information and transmitted through dialogue and participation. Most often, women are the controllers and purveyors in local learning systems related to water, health and sanitation (Roark, 1980). Reporting on local learning systems dates from many years back to the present day and reveals the persistence and validity of such systems. Ulluwishewa (1994) and Bhatt (1995), for example, point out that in the dry zones of Sri Lanka and Gujarat, India, women continue to use indigenous knowledge systems on managing water quantity and quality. Family members (29 percent) and fellow villagers (36 percent) were the main sources of health information mentioned by women in three villages in Dhaka district, Bangladesh (Laubjerg, 1984). Informal contacts were also major channels for dissemination of health information to women in rural communities in Guatemala (Colle and Fernandez, 1978; McConahay, 1995), Tanzania (Therkildsen and Laubjerg, 1982) and the Philippines (Tiglao, 1963).

In traditional primary health care, women's networks and local midwives play an important role. In communities in Upper Egypt (Most, 1982) and Java, Indonesia (Hull, 1981), they were found to be more effective in responding to women's needs than formal health care systems. Investigation of the health knowledge of midwives in East Java showed that they had better knowledge of food hygiene, sanitation and insect and rodent control than male

heads of household. The latter scored only slightly better on water supply knowledge and considerably better in housing (Amsyari and Katamsi, 1978). This is not surprising since most of the issues discussed were the responsibility and expertise of women rather than men.

Informal women's groups provide good opportunities for communication. Water sources where women bathe and wash clothes and utensils often are much frequented meeting places (Wijk, 1985). In a rural community in Taiwan, there were five district neighbourhood groups, and these were linked in an overall network of village women (Wolf, 1979).

> 'These were the women who were likely to be found washing clothes together, minding each other's babies, or simply chatting together. Each group included women of all ages, ranging from the youngest bride to an aged grandmother... Each group usually had at its core a handful of middle-aged women who had long been resident in Peihotien. They were, informally, its leaders, the women to whom younger women turned for advice and help' (Wolf, 1979: 43).

Curtis et al. (1997) reports similar networks in the urban environment of Bobo-Dioulasso in Burkina Fasso. While local learning systems on water and health evolve around women, men have their own subjects and channels for communication. In many cultures these two systems of communication will not mix (Drangert, 1993; Karp et al., 1990; Olsson et al., 1990; Thomas, 1994; Tunyavanich et al., 1987; Wijk, 1985). Hence it is not correct to assume, as many development projects do, that information given in communications with men will also reach the women and vice versa. More orientation on local learning systems can make information and communication more effective.

3.4.2 Management of water resources

Holistic approach

In the preceding sections, the division of work between men and women, and the roles of women in the management of water and waste and in local learning systems have been discussed. Studies and field reports on women's and men's roles in public management of water resources show that women are also involved in the public management of water resources. Indigenous management of water resources is present especially where water shortage necessitates careful handling or where a highly developed water culture exists associated with religious connotations and functions of the water and its sources (Wijk, 1985).

Where several water sources exist, such management tends to be holistic, that is, the available water sources are perceived as a total package. The sources in the 'package' either have multi-purpose use, or each source or site of a source is allocated to a particular purpose, such as collection of drinking water, bathing, clothes washing, cattle watering and irrigation.

Integrated water resources management is thus not a new invention but has been part of indigenous systems for a long time, beit on a local and not full river basin scale (Rebers, 1990). Describing the water and land use system in the Sudan zone of West Africa, Kortenhorst (1980) distinguishes three cropping systems (family farms, male fields and female fields); two livestock systems (large livestock owned by men and grazed by boys and small livestock owned and cared for by women), three food gathering systems (hunting by men, fruit and root gathering by women, and fishing), and three types of off-farm income generation (home processing and trading by women, migrant labour by men). In Zambia, Matiza (1994) devides fishing into fishing by men in deeper water and by women in shallow water. Such a holistic system of resources use is set up to maximise production and minimise risks. Kortenhorst (1980) criticises the single sector approach, which is narrowly focused on the macro economy and overlooks the substantial economic contribution of women. He pleads for an approach which

> 'leaves space .... for such family and community needs as the inclusion of "minor" subsistence crops, special "women's fields", livestock as an integrated part of the system, production opportunity for petty trading, crops that are suitable for small-scale processing industries to provide off-farm employment and last but not least the ownership of the land' (Kortenhorst, 1980: 130).

Kathleen Cloud points out similar traditions of holistic uses of water and land:

> 'Historically, traditional irrigation systems have been used to provide water for domestic purposes, including drinking, in such places as Sri Lanka, South India, Syria and Assyria, Greece, Rome, the Nile river valley, Meso-America and the highland Andes. Today, irrigation systems are used to provide drinking water in Nepal, Pakistan, Jordan, Mexico, Guatemala and California, among other areas. Other non-agricultural uses of irrigation water, variously practised, are for bathing of people or livestock, swimming, washing clothes, washing and cooking foods, watering household gardens, production of energy for milling and electricity... Yet the traditional engineering view of systems is limited to provision of water for crops' (Ault, 1981 in Cloud, 1994).

Ulluwishewa (1994) gives a detailed description of integrated water resources management in the dry zone of Sri Lanka. Small irrigation tanks served to cultivate rice and as sources for domestic water. The women used botanic means to improve the water quality and managed its quantity and the tree vegetation in the catchment area to preserve the source. In South India, an NGO used gender-specific participatory appraisal to map such multi-sector resource use at village level. However, the mapping was stopped halfway by the financing authorities, as there was no broad support for such a participatory and cross-sector investigation (Down to Earth, 1992, 1994).

The literature thus indicates that, in various cultures and regions, women and men are both involved in the informal management of water resources. Methods used are user rules and

regulations, management by user groups, often of women, and shared management by women and men. Overlooking existing management systems often means that in the management of new systems, mainly men get involved (Figure 7).

User regulations

Sometimes water resources management is executed through regulations and social control of resource use, maintenance and hygiene, as in communities in various parts of West and East Africa (Wijk, 1985), Indonesia (Smet, 1978) and Papua New Guinea (Feachem, 1973).

> 'Restrictions on watering cattle at traditional sources for drinking water and on washing clothes downstream were found in at least six East African tribes. However, these restrictions do not necessarily apply to upstream use beyond the range of vision, and the men do not always keep their cattle out, since their only interest is that the cattle get good water' (White et al., 1972).

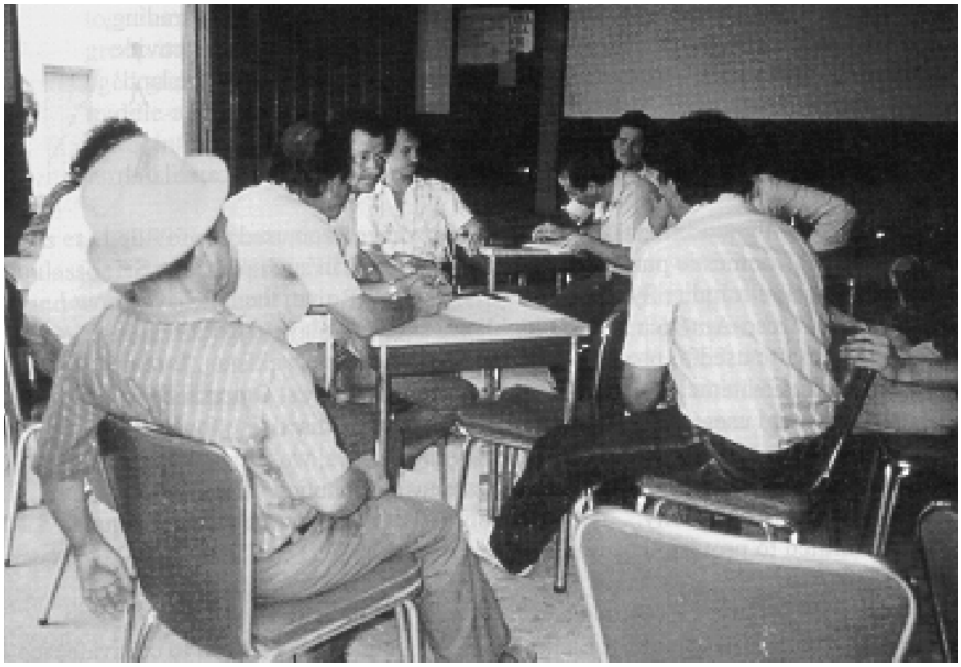

Figure 7. The water committee signs the contract of a community-managed water supply system in a local bar (photo: C. van Wijk, IRC).

Conflicts over water use and management are more likely to occur where men and women use the same scarce water sources and ownership can be challenged (Groote, 1990; Jácome and Krol, 1994: 48; Wijk et al., 1996: 96). In the Sahel zone of Niger a system existed whereby private well owners shared their wells with other cattle owners and domestic users through a system of negotiation. When public wells were introduced, source management declined and conflicts over water increased (Bayard, 1991). In dry areas of Tanzania and Kenya, women make shallow drinking water wells in dry river beds. While meant for human drinking water it is not always possible to prevent them from being

used and trampled by cattle. Similarly in Malawi women disliked men's use of water and clay around water points for brickmaking, when this creates deep pits which fill up with stagnant water and generally makes the upkeep of hygiene and safety to small children a problem (Wijk, 1985). In Ecuador conflicts occur mostly over water theft in the dry summers. Jácome and Krol found no indication that female irrigators were robbed more often than males. Moreover the women have an active role in water management in the field and try to solve the problem directly. Only when direct conflict resolution fails will they call upon higher levels of management, in which they are far less well represented.

Evidence of women as arbiters in water management conflicts also comes from other parts of the world. Quoting Illo (1988: 42-43), Cloud (1994: 10) reports that, in an irrigation scheme on the Aslong river in the Philippines membership of the water users association was made in the name of the household, not that of the male head. This enabled women and youth to take part in user assemblies and to take up a mediating role. Financial obligations were then better settled. She also quotes a report from Indonesia, where the farmers of the upper slopes asked their wives to act as intermediaries in conflicts on water with the farmers of the lower slopes. Only when no agreement could be reached in this informal way did they go to ask irrigation officials for help. Officials of the Ghana Water Supply and Sewerage Board have mentioned similar conflict mediating and depoliticising roles of women and youth in domestic water supply projects to the author of this book.

Management by user groups

In a number of cases maintenance of water sources and village hygiene are the responsibility of specific women or of women's organizations. Key factors seem to be a matrilineal society, a strong water culture and ownership (by household or group) of the source.

An example is Samoa where traditional women's societies were responsible for the maintenance of domestic water sources and sanitation (Schoeffel, 1982). In Tonga, a water supply and sanitation project at first considered only the management roles of men and overlooked the roles of the women. The project failed. Bringing in a gender approach proved to make a difference, and the now effective project was replicated in 18 other villages (Fanamanu and Vaipulu, 1966). In Sri Lanka effective traditional maintenance is here associated with the ownership of the land on which the well is located. The women and children in the household of the owner carried out maintenance of shared neighbourhood wells.

> 'The cleaning of the well is a major task. All water is scooped out and the walls are rinsed and rubbed with a stone or coconut husk. Mud is taken out with a bucket or a coconut shell, holes are plastered, and the edge is cleared of vegetation. Flowers and a religious chant complete the work' (Kelles, 1983).

Among the Lango in Uganda, the Wasukuma in Tanzania and in south-west Burkina Faso, management of water sources relates to the joint activities and decisions of women to improve their water supply (Drangert, 1993; White et al., 1972; Roark, 1984).

'Where there is sharing of sources, there is usually some feeling of responsibility for keeping the facilities clean and in working order. The Gogo [who live in Central Tanzania, on an arid plateau with muddy ponds and riverbed wells] do not improve the sources much, and so there is no strong organization for this purpose. One woman may, however, use the hole dug in a dry stream by someone else. The same pond may be used for drinking, washing, bathing and watering cattle. Among the Lango [who live in Uganda, by a swampy river with waterholes dug along its course], there is a strong feeling of responsibility. A group of women together will dig and clean the small hole which constitutes a well and keep it clean. They will not prevent other women from using the well, but they may make remarks about their laziness in failing to build their own or to maintain the common one' (White et al., 1972: 240).

Differences in traditional management and maintenance of water sources may occur within a relatively small geographic area. A study of water use in Kibwezi Division, a dry area in central Kenya, showed a great variety in user practices. People and livestock used some ponds indiscriminately and simultaneously. At other ponds, cattle watering and domestic water collection took place at opposite ends. At yet other ponds, small mud enclosures had been constructed, through which clean water filtered into a small reservoir beyond, but unfortunately no details are provided on who was responsible for these improvements (Oendo, 1983). Similarly, no information is given on improvements to natural springs used by women in a highland community in Guatemala (Buckles, 1980). However, it is likely that women were involved since they have been reported to make similar improvements elsewhere in East Africa (Tanzania et al., 1984; White et al., 1972) and in Burkina Faso (Roark, 1984).

Shared management

In other societies it is the responsibility of male community leaders or water supply owners to maintain the domestic water sources (Wijk, 1985). However from the descriptions it is not clear whether the women take informal action to ensure that these management duties are fulfilled. In Ghana and Burkina Faso, wells are dug by men but 'it is the women who decide when to build a new permanent water supply' (Jørgensen, 1980) and who contribute to the maintenance (Boesveld, 1982). Further experience from Burkina Faso provides evidence to support the double function of women in maintenance and mobilization of male authorities.

> 'The need for a new water supply is discussed firstly in a women's meeting. Thereafter, the recognized women leaders approach the chief and elders to organize a meeting. Presentation at the meeting varies between villages, either the women representatives present the information, or they remain silent while their husbands and brothers present their case. Their request is always heard but

> sometimes the leaders are slow to organize a meeting. Then the women ask the council to review the progress made. This is an implicit reprimand and always works. The women also decide on source maintenance. They either do the work themselves, or when outside economic or work resources are needed, put the problem to the council' (Roark, 1984).

3.4.3 Visibility of indigenous management system

It is quite likely that the traditional involvement of women in public management of water resources, and to a lesser extent in village hygiene, is more widespread than at present realized. This assumption is based on several arguments and also on experience.

First, the informal nature of much traditional maintenance and management means that it is not always obvious to male technicians involved in introducing new facilities. They are further constrained by the socio-cultural gap and restrictions on communication between men and women, and are not expected to give time and attention to existing facilities and structures. When, if at all, male staff discuss issues with women, women in Zambia and Zimbabwe are expected to receive them as guests with food and drink, and not to discuss content issues (Muller, 1976; NCU, 1991).

Second, women's studies have concentrated mainly on the domestic and economic tasks of women and their exclusion from the formal public sphere, and have not emphasised their traditional involvement in management.

Third, the attitudes of the women and local leaders themselves contribute to the lack of awareness of their involvement. In the examples cited from Sri Lanka and south-west Burkina Faso, the women made the decisions and carried out the work, but in both cases, the men and women referred only to the involvement of the men. The same was also the case in Ecuador (Jácome and Krol, 1994: 40) and Tanzania (Drangert, 1993: 213).

> 'In Sri Lanka, credit is given to the men who are supposed to do this work because they are ritually cleaner than women, who menstruate and bear children. In reality, the men only assist when wells are very deep, difficult to clean, or ritually very important. Otherwise, they claim that they have no time and that only women use the wells' (Kelles, 1983).

A factor mentioned by Drangert is the abolishment of traditional leadership systems. Women have few women on the modern councils to whom they can turn and sometimes do not even know their names. Strong views exist that women should not raise their voices in the council or village assembly. Any issues of water can be raised only by men. At the same time, men and women do not communicate on water. Consequently, when water issues are raised, they concern water for cattle rather than water for households. The right to put water on the agenda 'is exercised mainly by well-to-do-farmers and mainly in connection with water for cattle' (Drangert, 1993: 143).

Drangert continues to describe how in Sukumaland the traditional norm is disappearing. This norm prescribes that ‘men must develop water sources but will not cooperate in fetching water except in emergencies’. As a result, women are more inclined to take action on their own:

> ‘We cannot tell the men to dig when the lambo has dried up. Every woman has to find her own way to collect water. We have to look for all kind of places and in the end we have to dig a pit in the lambo itself to extract seepage water. Usually this is the task of the man because it is hard work to remove big stones. But, alas, he does not do this. Instead he only sits waiting for us to fetch water and we are forced to use our own efforts by hoe, shovel and crowbar. If the water is completely finished the men may start, but traditional cooperative efforts have been reduced. It is no longer certain that the men will be able to convene and agree on an action, and they do not want to be given orders by leaders’ (Drangert, 1993: 207).

The greater role of the women did not emerge until participant observations were carried out by a woman anthropologist in Sri Lanka (Kelles, 1983) and Ecuador (Jácome and Krol, 1994). In north-west Tanzania Jan Drangert used in-depth interviews with women and men to gain insight into the often hidden negotiation that takes place before a water source is improved or a new source developed. In Burkina Faso, insight was gained when the process of management was discussed in a separate women's meeting during project planning (Roark, 1984).

> ‘Questions concerning actual water management decisions were disappointingly vague from both groups (women and village leaders). Questions asked were variations of "who has the responsibility for choosing a new water source?" or "who decides and carries out maintenance?". All responses were general in nature, "the village, the chief, the council", and did not clarify or indicate how decisions concerning use and management were actually made and carried out. On the other hand, the complex interdependencies and prioritisation that were evident in the discussion of use criteria (with the women) seemed to indicate the existence of an acknowledged decision-making group. Therefore, within the women's meeting the question were once again rephrased using the interrogative "how" rather than "who” This differentiation allowed the women to state "how" the tasks and responsibilities were actually performed and managed rather than "who" had the ultimate political or cultural leadership’ (Roark, 1984: 58-59).

Because gender divisions in local resources management are often very subtle, they may easily be overlooked. As a result opportunities are forgone to integrate local and external maintenance systems in better operation and maintenance (Burton, 1974). An open eye for gender-based indigenous water management allows projects to build on what exists, and to validate, rather than annihilate, such systems due to ignorance.

4. Operationalization of a Gender Approach in Drinking Water Supply

Following on from the preceding discussion of the place of gender in current policy thinking on management of water resources, this chapter summarizes experiences with the operationalization of a gender approach in the drinking water sector. Gender-specific demand assessments have given women the chance to influence demand within the household and the community. A cautious shift to informed user choice, coupled with a wider range of options to choose from, can be noted. In principle, this should also allow poorer communities and households to install and use a service they can manage and maintain, and be less dependent on government. A gender strategy is more common in local design. It has provided enhanced service access also to poor women. Other results are better quality design and system performance, a more general system use, and recognition of women's decisions in water management. Knowledge on ways to overcome practical gender constraints has grown. Strategic change is rarer: much of women's participation in maintenance and management is, in fact, free contributions of labour and time, without much control. With many participatory water systems having been in place for ten years or more, it now becomes possible to assess whether work or control makes a difference to sustainability of services. The chapter gives cases of gender-sensitive demand management in water projects. More holistic water supply development and management which acknowledges multiple interests is starting, but suffers from gender-neutral reporting. Hence it is not always clear how women and men contributed to and benefited from reported successes.

4.1 Gender and responding to demand

Overwhelming evidence exists that water supply services that do not respond to demand are not properly supported and used (Abdullah and Boot, 1989; Andersson, 1984; Fernando, 1985; Jayasinghe et al., 1983; Job and Shastry, 1991; LBDA, 1983; Oendo, 1983; Tunyavanich et al., 1987; Versteylen, 1991; Wijk, 1985). Such reactions cannot be attributed merely to a lack of interest, cultural barriers or the inherent conservatism of poor rural people. On the contrary, their behaviour is often the result of one-sided design decisions by the agency without attention to the ways in which men and women in households make their choices. The rationale for such choices is different from and more comprehensive than that of the 'experts' (Golloday, undated). If water agencies want to see their facilities used and supported they need to be responsive to what users want and can afford to use and maintain - in socio-economic, financial, technical and managerial terms.

4.1.1 Demand for improved water services from men and women

Having different responsibilities and interests, men and women do not necessarily have the same demand for an improved water supply. Sometimes both women and men have a demand for better domestic services (Colburn, 1981; Kebede, 1978; Tanzania et al.,

1982). However, in other cases, men are not interested in expenditure for such a purpose (Chachage et al., 1990; Gondwe, 1984; Mukherjee, 1990; Sumbung, 1984; Sundararaman, 1986). In Mexico, husbands and fathers did not consider three hours for daily water collection as excessive (Miller and Cone, 1984). Alternatively, men are interested because they expect to benefit economically through irrigation, watering cattle, etc. (Boesveld, 1994; Agarwal and Anand, 1982; Groote, 1990; Schenk, 1984; Talbert, 1984). But also women may have a demand for a better water supply for both domestic and economic use (Carr, 1981; Nieves, 1980; Bissiliat, 1978).

Nor is a water supply always a first priority. Other facilities which are more time and labour saving, for example, a grain mill, may have greater perceived social and economic benefits than an improved water supply (Sieber, 1997; Wijk, 1985). It may also occur that neither men nor women have a demand for an improved water supply, for example, because there are no convenience problemsand knowledge of health risks is either absent or not applied locally. Projects are also carried out because they are allocated from above, or initiated by influential individuals for professional or political reasons (Cardenas, 1979), not because there is a real demand for them in the community at large.

Early literature already confirms that when women are informed and consulted, this has a positive impact on demand for improved domestic infrastructure. Household surveys in Chan Kom, Mexico (McGarry and Elmendorf, 1982), Bangladesh (Laubjerg, 1984), Indonesia (Dian Desa, ca. 1990) and Pakistan (Kishwar and Barq, 1990) brought women's interest in improving water supply and sanitation infrastructure to light. In Kenya, members of a Masai women's group managed to collect funds from the sale of traditional beadwork and attract financial support from urban women's organizations. Thereupon their husbands gave a large donation to the water project (Gachukia, 1979). In Latin America, which has a long history of demand-responsive community managed water supplies, a common role of women is to mobilize this demand. User households then pay some 20 to 40 percent of the investment costs and all of the direct recurrent costs, in time, labour and cash (Edwards et al., 1989; Espejo, 1989; Jaeger and Mattson, 1989; Meehan and Viveros, 1982; Wijk, 1985).

In urban areas, interest in improvements to water supplies and other infrastructure is usually high because of a shortage or excess of water, unsanitary conditions and problems of privacy and safety for women (Espejo, 1994; Schmink, 1984; Seaforth, 1995). To obtain and support these basic services, communities have exerted pressure on urban authorities, with women involved as motivators (Espejo, 1994; Kinley, 1991b; Racelis, 1977). Factors contributing to the initiation and participation of women in urban water supply and sanitation projects have been their awareness of the risk to family health of poor environmental sanitation (Brasileiro et al., 1982; Schmink, 1984); opportunities for recreation for children and beautification of their environment (ADC, 1982); and common economic interests in an adequate water supply, for example, for beer making (Nelson, 1980) or clothes washing (Agarwal, 1982).

4.1.2 Meeting the obligations within the household

In a demand-responsive approach the agency installs the system and service level that best fits the users' demand and willingness to pay (Wijk and Walle, 1995). Women are responsible for water supply and waste disposal and obtain domestic and occasionally economic benefits from improved facilities, and so are motivated to improve them (Read and Kudat, 1992). But men also need to be involved as they usually contribute finance and labour. Local men have less appreciation of the benefits to their wives than is sometimes assumed by project planners and designers. Several reports from the Indian subcontinent state that men have objected to reduction in water collection time and effort for their wives and children, because they want to preserve this traditional role (Golloday, undated; Kumar, 1993; Misra, 1975; O'Kelly, 1982). The men feared that less work would make women and children idle and provide opportunities for undesirable behaviour. In villages in Guinea Bissau and Tanzania, on the other hand, men have welcomed a closer water supply, not because it has reduced the workload for their wives, but because they could see what their wives were doing, and thus keep them under control (Ploeg, personal communication).

The involvement of women in financial decision making increases with their economic role or recognition of their domestic role. Wijk (1985) reports three patterns. In some areas, for example, in most of northern Africa, the Middle East and southern Asia, husbands control and decide all financial issues. The domestic and economic contributions of wives seem not to be reflected in decision making. In other areas, such as parts of East Africa and Morocco wives have separate income-generating activities. However profits are small ("pin money") and often in kind, so that the women can retain control over them. In parts of West Africa and East and Southern Africa wives and husbands each have and control their own income. Women's incomes are usually lower, because cash crops are grown by men, and women spend a greater proportion on basic necessities for the family. As a result, and although they have less income than men, women are often expected to pay for water and other first necessities of life (Huysman, 1994; Oenga and Ikumi, 1991; Valera, 1987). However, cultural norms about gender may prevent the women from revealing that they, rather than their husbands, make the payments. Officially the men are in charge and wives who help finance family needs should not say so to prevent husbands from losing face (Mottin, 1991).

The important contribution of women to the household income in low-income households in India (Huysman, 1994, Safilios, 1980), Bangladesh (Marum et al., 1983), Nepal (Diamanti and Heyn, 1985), Thailand (Tunyavanich et al., 1987) and the Philippines (Res, 1983) is consistent with their influence on the domestic allocation of funds. Increased male labour migration has also led to greater responsibilities for and contributions to the household economy by women (Souza, ca. 1997; Gray, 1982; Naveed-i-Rahat, 1981).

4.1.3 More options to meet varying demand

While important, high interest and priority need does not guarantee that everyone will be able to participate in water and sanitation projects. Households headed by women have been excluded from improved infrastructure, not only because they did not have the required finances for substantiating their demand, but also because they could not supply the labour demanded for construction (BMB, 1990; Tanzania et al., 1984). In some projects, special arrangements have been made for such cases. In an urban project in Panama, women who could not afford the rates of professional builders were trained to do their own plumbing (Girling, 1983).

Choice of technology and service level

In some projects, future users are involved in choice of technology (Anafu, 1996; Attanayake and Jayasiriwardana, 1996; Livingstone, 1994; Sansom, 1996; Visscher, 1982). Already in the 1980s, the question was being raised as to whether or not future users should be more directly involved in the choice of technology, when the maintenance, management and running cost financing of these technologies were to become largely their responsibility. A checklist to help choose sustainable piped water supply systems was published in 1991 (IRC, 1991). It was replaced by a full guide in 1997 (Brikké et al., 1997). Improvement of existing sources or increasing the number of hand-dug wells may be a better solution for some villages than the introduction of handpump wells or boreholes with motorized pumps, the maintenance of which cannot be guaranteed (Andersson, 1984; Andersson and Hannan, 1984; Roark, 1984).

Giving communities a choice implies that the various user groups should be given all the information necessary to make informed decisions. In a community which uses less than 10 litres of water per person per day, information about the type of health improvements which could be expected from increasing the quantity to more than 20 litres per day may well be crucial in a decision to select a lower level of technology. Such a level can provide a more reliable supply of slightly less quality (Roark, 1984). When Dian Desa, an Indonesian NGO in water and sanitation, consulted users on technology choice, it found that rural users preferred dug wells, since they are cheaper, allow cost-sharing in labour and can be deepened if needed. Peri-urban families, with less space and time and more cash, preferred drilled wells. All preferred private over public or shared pumps, to avoid conflicts over use, water consumption and payment. When this demand was heeded, households paid part of the construction and all of the operation and maintenance. The main reasons for a quarter of the pumps being out of order is not poor operation and maintenance, but poor pump quality and corrosion (Dian Desa, ca. 1990; Sudjarwo, 1988).

Becoming more demand responsive also worked for the IKK project for piped water supply in West Java. Originally the project promoted designs made by the technical staff without consulting users and without offering them choices. Its district staff now encourage community self-surveys, mainly implemented by women, to raise and assess demand.

Staff then adjust the scheme designs to this demand. The change in approach has increased the number of house connections and improved access, though not to the poorest people (Mikkelsen et al., 1993).

In the handpump programme in South Guinea Bissau, villagers could choose between two new protected wells with pulley and bucket or one handpump well. A gender strategy ensured that women took part in this choice. One third of the villages opted for the protected wells (Visscher, 1982). Studies in Guinea Bissau and Sierra Leone show that, while not completely free from contamination of E-coli, protected wells are a considerable improvement on traditional sources (Visscher, 1982; Wright, 1985). On the other hand, in Thailand, households did not maintain handpumps because they provided too low a service level in the eyes of the users. 'Any system that would offer an incremental improvement would need to be displayed and be perceived as offering either better quality, greater quantity or more convenience' (Dworkin et al., 1980: 12).

A greater range of technology choices and service levels recognizes the variation in capacities to finance, maintain and manage improvements. It also makes services more accessible to the poor. Piped water projects which offer only private or yard connections are not affordable to the lowest income groups (Chetwynd et al., 1981; Dworkin et al., 1980; Huysman, 1994). Wealthier households, on the other hand, who are ready and able to pay for the extra investment and running cost of a higher service level, have been kept from doing so. The reason was that either the water policy only allowed public taps, or the source capacity was insufficient due to poor management of the water resources (Wijk, 1989).

Adjustments to designs

Adjustment of designs to user demands is more common after the technology and service levels have been chosen. Experience shows that many systems that do not respond to user knowledge and demands have design mistakes and are therefore not used and maintained. Such adjustments often require a responsive attitude and a creative frame of mind from agency staff, rather than extra resources.

Given the differences between men and women in work, areas of communication and learning and expected benefits, a gender approach plays an important role in ensuring that water supplies can meet local demands and conditions. Long experience in the management of water means that women have particular knowledge and requirements for new water systems. In selecting sources for gravity water supplies, women's opinions on water quality were important in Malawi and Tanzania (Malawi, 1977; Tanzania et al., 1983). In the Philippines, women assisted in selecting the best intake site and route for a gravity supply (Glasgow, 1984).

On the other hand, implementors in India failed to consult women on acceptance of water quality and locations of water points, and this affected use negatively (Mukherjee, 1990). Not consulting women in a water project in Malawi led to poor location and inconvenient

design of facilities and so resulted in no use, or incorrect use of the facilities (Kwaule, 1994). Drawing on experience in Burkina Faso, Nepal, Malawi and the Pacific, Ball (1991) and Roark (1994) comment that projects still tend to consult only male leaders, though they often have less knowledge about water sources than the women acquire through their daily use.

Without a gender strategy, only men, especially those with wealth and influence, often decide on the location of water points. The location benefits them and their families and other members of their class in particular. Poor women have no access for their households, because they live in unserved neighbourhoods or the wealthier monopolize the source (Job and Shastri, 1991; Mlama, 1994; PRED, 1991). Wealthy families in Bangladesh (Imam, 1983) and India (Dhawan and Wijk, 1980; Huysman, 1994) have monopolized subsidised water systems.

A survey in fifteen villages in Tanzania showed that women in more affluent households had a significantly shorter distance to walk to public taps (Wijk, 1985). The National Planning Commission of India investigated the effectiveness of the National Programme of Minimum Needs in 99 villages in 17 states. Eighty percent of the waterpoints were public, but only 16 percent were located in poor areas. Poor areas made up one third of the visited settlements (India, 1980). Another Indian study, in 1991 in Andhra Pradesh, found that the poorest 11% was not served. Meanwhile, 19% of the other households had a private tap, in a scheme that was only designed for public taps and built with 100% subsidy (PRED, 1991).

When they are consulted, the demands and experiences of women play important roles. In Tanzania and Zimbabwe, women in some communities wanted the waterpoints to be located outside the village on common land, so they could use the surplus for vegetable gardening (Wijk, 1985). Locations for handpump wells have been changed because the proposed site required negotiating a steep slope (Malawi, ca. 1983) or the source had a poor taste (Ploeg, 1979). In Guinea Bissau, the acceptable salt content of well water for one ethnic group was less than 200 mg/l. Because salt content was lower in the valleys between the villages than in the villages themselves, the women proposed to locate the wells there, even though it meant extra walking (Ploeg and Wijk, 1980).

Already in the 1980's and earlier, project accounts have shown that, in a gender approach, women bring up relevant issues from their own areas of knowledge and responsibility. In the Philippines, women pointed out that the tap site selected would force children to cross a busy road (Racelis, 1979). In Mexico, women rejected house connections in favour of patio taps, because drainage, and leakage, would be less of a problem (Kelly, 1953). When the plan for sharing rainwater collection tanks in western Java, Indonesia, was submitted to the households concerned, they changed it and based it on social criteria (Segaar, 1979). Similar experience has been reported on the sharing of group connections of piped water supplies in rural communities in Guatemala (Buckles, 1980).

Male knowledge and concerns differ from those of females. This was demonstrated already by the cases where men preferred sites where they can control the women. Other cases concern the location and use of water for livestock versus domestic use (Boesveld, 1994; Hemmings, 1979; Murre, 1989) and the construction of clothes washing and bathing facilities. In Tanzania (Hannan, 1984; Tanzania, 1984) and Ghana (Harkness, 1983) men preferred to bathe at home with water that their wives had collected and heated. Here and in other cases, women and children bathed at the source to reduce heavy water collection work (Carter and Mends, 1982; Copperman et al., 1978; German Federal Ministry of Economic Cooperation and UNICEF, 1983; Kauzeni, 1981; Therkildsen and Laubjerg, 1982). Water agencies do not always take such gender needs into account, either because they are not within the scope of the project, or because washing and bathing at the source are considered to result in unhygienic conditions and contamination of the source. Prohibiting clothes washing and bathing at the source is however seldom the solution. An imposed ban is not effective or it leads to more transport work or less water being collected for hygiene (Andersson, 1984).

To meet the requirements of the women, communities in Guatemala (Buckles, 1980; McEachen et al., 1983), Indonesia (Sumintardja, personal communication and Figure 8), Ghana (Harkness, 1983), Saint Lucia (Celestin, 1977), India (Clinard, 1966) and Iran (Development Workshop, 1976) united to construct and manage shared facilities for washing and bathing. Sometimes, women were passive beneficiaries (Development Workshop, 1976), but their function as domestic water managers made it also possible for them to be active designers and managers, in Tanzania (Tanzania et al., 1983), Bangladesh (Laubjerg, 1984), Indonesia (Parwoto, 1989 and Figure 8) and Zimbabwe (Toit, 1980).

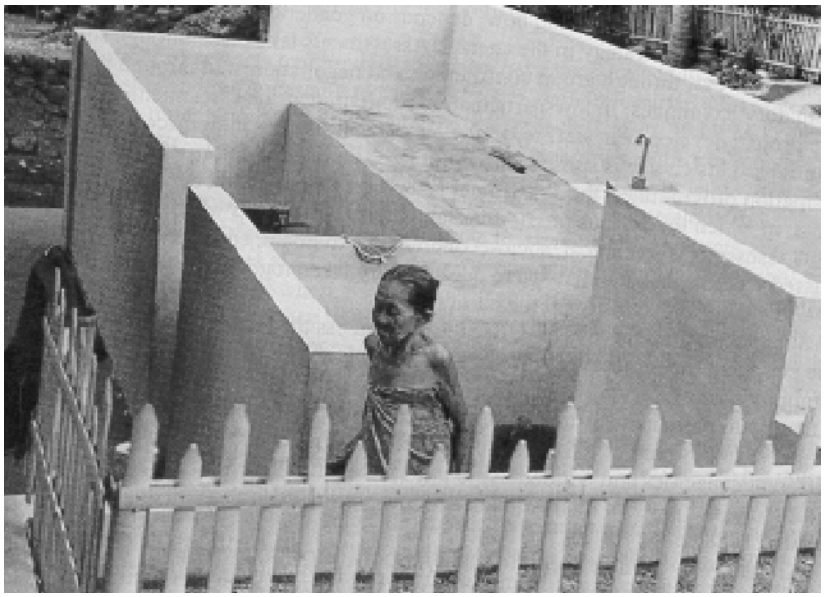

Figure 8. Improved washing and bathing facility designed and managed by the users in an Indonesian kampung (photo: Sumintardja, Institute of Human Settlement)

Adapting designs to the demands of the users needs not cost more. Often, through a gender approach, a good solution can be achieved. In Kerala, the involvement of men and women in site selection led to a better service coverage at lower per capita costs (SEUF, 1994). The additional washing facilities mentioned above were partly or fully financed by the communities themselves. The decision can lead to hot debates between women and men, as witnessed by the author in Zambia. This case concerned a choice between centrally located waterpoints at a high elevation, so with a lower pressure, and points with a greater water pressure in the valley. Male and female leaders both agreed that the second option was better. But since the location would involve heavy uphill carrying of water, the women suggested a washing and bathing facility to reduce the transport costs. The men were agreeing to this, but wanted the women to finance the extra costs. The women argued that, although they would use and manage the facility, the men would benefit as well from the women's reduced labour and the greater hygiene of the family, so all should share the cost. In the end a cost sharing arrangement was reached which reflected the differential financial capacity of both sexes and the benefits to both groups.

4.1.4 Assessing the demands of women and men

Whose demands are assessed, and how, depends on gender conditions and the presence of a stratified gender strategy in the agency. Assessments take place through socio-economic surveys, through group consultation and negotiation, and through the use of participatory techniques. In low-participation programmes, the assessment data are used by the project development staff to decide on the best fitting solution according to their perceptions. This choice is subsequently promoted among the future users. In high participation programmes, the assessment is the first step in a joint decision-making process, in which the various possibilities and their implications which emerge from the various assessments (technical, socio-economic, institutional, environmental) are discussed with the stakeholders. Here decisions are taken together, on the basis of the joint knowledge and skills of all the participants.

Socio-economic surveys have been used to assess the general interests and capacity of the people in the project area (Wijk, 1985). Sometimes these are individual community studies, serving to identify the interest, willingness and capacity of each community to participate, usually in a standardized type of project. More recently, willingness to pay studies introduce several technologies and service levels in response to different capacities and willingness to pay (Mu et al., 1990; Singh et al., 1991; Whittington et al., 1992). Evaluation of user perceptions also serve to improve designs (Mujtaba, 1988).

Alternatively agencies get information from and consult with users groups in group processes. This is done through direct discussions or with the help of participatory techniques. Techniques such as participatory rural appraisal (PRA) and SARAR (So called as it leads to Self-esteem, Associative strength, Resourcefulness, Action planning and Responsibility) help future users to analyse their situation and review options using games and group activities (Chambers and Guijt, 1995; Srinivasan, 1990, 1992).

Obviously, a cross-cutting of both men and women from different socio-economic and cultural groups has to take part in such assessments. Women are not always recognized as a separate category of participants. In evaluations in Ghana, Nigeria, Tanzania, India, Thailand and Indonesia, only male heads of households and authorities were interviewed, even about women's issues, such as water needs, water transport and use, laundry provisions, and preference for a foot or handpump (Wijk, 1985). Nor is a distinction between the sexes always made in analysis and reporting (Macharia, 1992; Madanat and Humplick, 1993; Mu et al., 1990; Zafar, 1994). In a number of cases, male heads of household were consulted on topics which are outside their sphere of knowledge and influence, or topics were discussed on which women have different knowledge, views and demands from those of men. Even when the woman is present, the culture will often not allow her to contradict her husband in his presence (Andersson and Hannan, 1984; Jayewardene and Kilkelly, 1983).

Although male staff can sometimes be used in assessments with women (Abdullah and Boot, 1989), female staff and separate sessions with women are to be preferred (Wijk, 1985). A separate approach is especially necessary in societies demanding the seclusion of women (Azad and UNICEF, 1983; Jilani, 1985), or in which women have separate responsibilities and working places (Visscher, 1982). A dialogue approach, group interviews and participatory activities in separate groups help participants to react more freely than in formal interviews (Swantz and Troil, 1984). Several authors further stress the need to differentiate between men and women of different age groups, in different socio-economic classes and in different ethic and religious groups. Only such a cross-cutting approach guarantees that findings reflect all important local differences (Gianotten et al., 1994).

In a number of projects, community members have been trained to assess their own community needs and resources and to carry out socio-economic surveys for water supply projects, though not always using a gender approach (Karlin, 1984; Mikkelsen et al. 1993; PSWS/IRC, 1981). An experiment in five communities in the Philippines found that this considerably reduced costs, while the studies were as reliable as those of agency staff. It also showed that sophisticated studies with many questions and complicated processing of data and insufficient feedback reduce the learning and motivational effect (Cross et al., 1980). These problems were avoided in Olancho, Honduras and in Bangladesh, where participatory techniques enabled women health promoters with little or no literacy to measure their work's progress (Vigoda, 1994). As one woman said: 'We did not want an evaluation that we could not understand and that would not have helped us to understand our problem - like just answering questionnaires' (Feuerstein, 1979: 64).

After gender-specific assessments, male and female groups have sometimes been brought together and each group asked to explain its outcomes to the other. This not only ensures that male and female distinctions are kept, but also allows each group to create

more understanding of their demands and makes it more logical for the women to report their work to the men as the men do to the women (Wijk, 1997).

Participatory assessments with a gender focus can lead to compromise solutions acceptable to all. In a project in Ghana, young women, men and older women disagreed on the location of runoff reservoirs and wells. The young women, who collect water, wanted it close. The men, who have cattle, wanted it near their grazing grounds. The old women sided partly with the women, partly with the men. A solution was reached which satisfied both male and female demands: new waterpoints nearby and upgrading of cattle dams (Murre, 1989).

4.2 Gender participation in decisions, implementation and management

Participation of the stakeholders in water supply development and upkeep is one of the now generally acclaimed principles of the overall water sector. Thanks to extensive experiences with the operationalization of this principle, much is known about the constraints which keep women excluded or divide the burdens disproportionately between women and men. We also know more about how such constraints can be overcome and what the effects of good participation are on the sustainability and use of individual water supplies.

4.2.1 Decision making

In many cases, gender relations and project procedures account for women having fewer opportunities than men to participate in discussions and decisions, in spite of their roles as users and managers of water, protectors of family health and educators of the new generation (Figure 9). Underlying these are the strategic constraints: no equitable division in rights, domestic and public roles, women's restrictions in autonomy over their own bodies, in access to and control over resources, independent choices in decision making, and rights to recognition and self-respect.

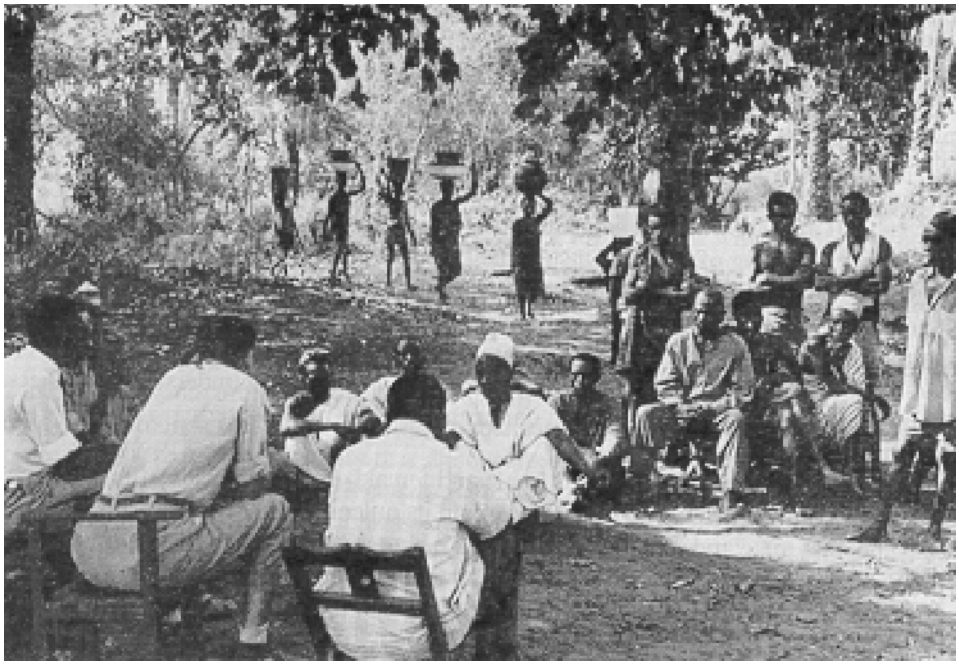

Figure 9. Without a gender approach men make decisions and women do the work and manage the resource (WHO photo by D. Henrioud)

Attending public meetings

In attending meetings, women are hampered by lack of time, information and freedom of movement. Women are often less informed about technical projects because project staff and village men consider this a male topic (Drangert, 1993; Sundararaman, 1986). In segregated and secluded societies, it is often difficult or impossible for them to attend predominantly male meetings, especially in male meeting places (Bissiliat and Rambaud, 1982; Naveed-i-Rahat, 1981; Sepulveda and Mehta, 1980). Men heads of household represent the family and it is assumed that the women are informed and influenced by their husbands (Bourque and Warren, 1981; Naveed-i-Rahat, 1981), even though research reported in the previous chapter shows that much communication is gender-segregated, and so male family members will keep the information to themselves.

Where women are able to attend meetings, they often do not speak the national language and feel restrained by their lack of education and because of cultural barriers (Andersson and Hannan, 1984; Bernard and Gayter, 1983; Mathew, 1990). Customary seating arrangements also limit their access to information:

> 'The scene is a small village in Upper Region [Ghana]. The community education staff of the Water Utilization Project have agreed to visit the village and make a public presentation on water protection. They arrive, are greeted by the chief and wait in his compound conversing with him, while the villagers are summoned for the meeting by the elders. The meeting takes place at the chief's meeting place. Community education staff must, by tradition, address the chief and elders. Men occupy the most prominent seats closest to the visitors. The women, however, sit

in the rear of the meeting place, some unable to hear or see accurately. The message is heard and seen clearly by the men, but a percentage of women do not receive the full message. Yet it is the women who are the primary water users in the compound and at the pumpsite' (Jackson and Palmer, 1983: 259).

Voicing views

At public meetings, the accepted role of a woman is often to listen to the men talk; she is not expected to express herself (Oenga and Ikumi, 1991; Poluha, 1993; Sumbung, 1984). Women are also less familiar with the public sphere. They have little experience in public debates, and even women councillors have been found to express themselves less freely or frequently than men (Wiley, undated). Men travel more widely on business and attend political and religious meetings, while women's mobility is restricted largely to visits to relatives, the dispensary, market, or flour mill (Marum et al., 1983; Villalobos, 1978). However, even without expressing themselves directly, their attendance at meetings gives them access to project information as the first minor step to project involvement (Hannan, 1984; Clinard, 1966).

Representation on decision-making bodies

Meetings of local councils and development committees are restricted mainly to men. A study of 18 communities in Tanzania has shown that the average number of women councillors is two out of 25 members (Wiley, undated). The highest number Smet et al. (1993) found in North Tanzania was four. In two provinces in Colombia, representation of women on approximately 3,500 community development committees is 8 percent and 17 percent respectively (Santacruz, personal communication). Absence of women in decision-making organizations is also reported in Kenya, Thailand, South Korea and Guatemala (Brandt and Cheong, 1980; Colburn, 1981; Mbithi and Rasmussen, 1977; Sepulveda and Mehta, 1980).

Female members of councils or committees do not necessarily take part in decisions or act as representatives for the interests of all women (Muller, 1991; Sundararaman, 1986). In Egypt, all local councils are required to have one female member, but the communication gap between men and women councillors and the community is very great (Abdel, 1983).

According to Indian law, one third of the members elected on the local council must now be women. A study in three villages in Madhya Pradesh, India reported: 'Often these women did not know they were elected' (Stanbury, 1984). More recently the author had the same experience in Gujarat. Women in the Lake zone in Tanzania said they often we not informed of elections and were not given voting cards (Smet et al., 1993). In Malawi and Sri Lanka, minimum representation of women on local development councils has been obtained through the functional representation of all chairpersons of local organizations, including women's party branches, traditional women's organizations, and mothers' clubs. Local women are involved automatically through their clubs and organizations (Fernando, 1984; Kandawire, 1981).

Although such measures increase the chance of having several experienced women representatives, poor households are not always included, either because they have no organizations, or because their organizations are not recognized (Karunadasa, 1984). Also, representation at community level does not give women a say in decisions taken at a higher level. In the Harispattuwa water development programme in Sri Lanka, all decisions, including the selection of villages for inclusion in the project and of well sites, were made by an all-male water project committee at district level (Kelles, 1983).

Consultation of women by men

The absence of women at local meetings and on governing bodies means that information and decision making is a men's affair, even on issues of which women have special knowledge and interest. This would be of less importance if they were consulted by the men. This has happened occasionally, for example in a water project in Guatemala, where the local male leader had established a farmers' association with six appointed subcommissions, including one on home making. These were all consulted on the water project (Buckles, 1980). However, discussion between men and women of what is considered to be men's business is the exception rather than the rule (Dey, 1983; Hannan, 1984; Huston, 1979; Olsson et al., 1990). In two villages in Andhra Pradesh, India, members of a women's organization did not know that a water project was being implemented in their communities. On the other hand, the local council and the village development committee (both all male) were fully informed (Wijk and Dhawan, 1980). In Majengo village, Tanzania, the women said that either they had not been informed in advance about the inconvenient location of the new wells, or that the council had not listened to their objections (Wiley, undated).

Overcoming constraints

Although the literature contains many accounts of women being excluded from local planning and decision making, it also suggests mechanisms to overcome these constraints at the community level (Table 2). Such constraints are overcome when agencies create and apply gender strategies as part of their activities to create an 'enabling environment' for new forms of water management.

Initiation. For a more balanced participation of men and women in meetings and decision-making bodies, the awareness and support of village leaders are primary conditions (Abdullah and Zeidenstein, 1982; Hoque et al., 1994; Tabotu, 1991).

Communication. The different information needs and channels of women and men require a gender approach in communication. To enable women to attend public meetings, women as well as men need to be informed and encouraged, using communication channels typical for either group, such as women's organizations (Mujeni, 1975) and networks and community authorities (Hannan, 1984). Reaching the men is important to ensure that women have the freedom to attend. In Bangladesh and India, women's participation in demand-raising increased when the programmes began to use a gender approach (Abdullah and Boot, 1989; Sundararaman, 1986).

Table 2. Ways to overcome constraints to women's participation

Activity	***Mechanism***
Project initiation	Programmes establish contacts with male leadership to understand and support also participation of women
Information and dialogue	Programmes use information channels and materials that reach also women
Meetings	Programmes facilitate women to participate and speak out in project meetings: • suitable time and place • awareness of meeting and invitation to attend • appropriate seating arrangements (not at the back) • facilitation of speaking out (vernacular language, discussion breaks, choosing spokeswoman, etc.) • separate meeting with women where necessary
Planning	Water and sanitation projects are linked to economic and educational development programmes, so that women can make developmental use of water and timegains and get new meeting and learning opportunities when traditional meeting and learning opportunities are reduced
Decision making	Programmes enable also women to participate in informed choices on: • caretakers and mechanics • committee members • design and location of facilities • local management arrangements • local financing system
Representation	Women choose their own representatives for trust, ease of contact, leadership capacity, feasibility (time and family support)
Management	Programmes build on traditional tasks, skills and knowledge of women for new roles in water supply, sanitation and water management (without excluding men): • management of water, waste and soil use • maintenance and repair of water points • hygiene education with fellow women • construction of latrines and monitoring their maintenance and use • management of funds
Training	Also women are trained for technical and managerial tasks Programme staff and management are aware of reasons and trained on practicalities of equivalent participation of women and men

Public meetings. To enable women to attend meetings the project must meet their practical gender needs. This goes both for the more conventional types of meetings where only discussions are being used, and meetings which use participatory techniques. Practical gender needs are met when the meetings are held at suitable times and places for women (Bingham, 1984; Oenga and Ikumi, 1991). Special efforts must be made to involve poor women, who are often not represented in women's organizations (Wijk, 1985). Neighbourhood delegations or meetings may help in this regard, because often poor and wealthy households are located in different parts of the community (Damen, 1993; Lobo, 1995; Zafar, 1994). Small neighbourhood meetings also facilitate women's participation (Clinard, 1966).

At the meetings, use of the local language or dialect and gender-appropriate seating arrangements enable also women to hear and understand what is being discussed. Feedback from women and men can be improved by the attitude of the discussion leaders and by prior discussion with the women.

In formal meetings a break in proceedings for men and women to discuss issues, and the use of a spokesman and spokeswoman to voice the opinions of each category can also assist (Mbithi and Rasmussen, 1977). In meetings where participatory tools and techniques are used, it is often easier for women to take part on an equal footing with men. Pocket voting, for example, is a technique where male and female participants have equal chances for participation and equal votes, and results can be reported in a gender-specific manner (Figure 10). But in participatory mapping, separate mapping by women and men, followed by each group reporting its findings and decisions in a plenary for joint decision making, was found more effective (Wijk, 1997). The use of small-scale models, photographs and drawings of the proposed facilities has also stimulated women to participate in decision making and to provide valuable feedback (IRC/UNDP-World Bank, 1994; Kwaule, 1994; McGarry and Elmendorf, 1982; PRG, 1980).

Figure 10. Pocket voting allows men and women to give autonomous views

Local educated women, such as midwives, nurses and teachers, have been found suitable intermediaries for the women at large, provided they discuss the issues with the women concerned. Their professional status makes their involvement more acceptable to male leadership in societies requiring the seclusion of women (Kamal and Maspero, 1978; Kanaaneh, 1979). In Latin America, schoolteachers have often played an important role in rural water projects as local promoters and spokeswomen (Haratani et al., 1981; Talbert, 1984). The same role has been played by representatives of local women's organizations, such as women's clubs and women's wings of political parties, although here the risk of representing only sectional interests is great (Hannan, 1984; Muller, 1983; Sumbung et al., 1984).

The use of gender approaches as part of regular procedures makes it possible to get gender-specific results without significant additional costs. Where such strategies are insufficient, a second separate meeting with local women, for more detailed discussion of planning issues related to their responsibilities and knowledge, has been found to be very effective (Mathew, 1990; Roark, 1984). Another method used effectively in segregated but non-secluded societies was to contact women at their places of work. This was practised especially because they did not have the time to meet elsewhere (Karp et al., 1990; Visscher, 1982). These approaches may not be appropriate in areas where women live in seclusion and social contacts are confined to the family. In such cases, agency intermediaries or development workers have made home visits and organized meetings in the homes of leading local women (Bakhteari and Wegelin, 1992; BLG/RDD, 1994; Schuurmans, 1994).

Decision-making bodies. A more balanced gender representation on decision-making bodies needs support from both men and women in the community. Women's participation is more readily accepted by the men if responsibilities are divided along existing gender lines, for example, if women on water committees are responsible for health (Chimuka, 1984; Siboe, 1983; Ybañez, ca. 1995).

Often the local women themselves make the best reasoned choice of their representatives (Abdullah and Zeidenstein, 1982; Tanzania et al., 1982). Reported experience indicates several selection criteria that are of importance in this selection (Wijk, 1985). The women selected should represent the interests of various socio-economic groups in the community. They must have sufficient time and mobility to carry out the work. Their position must be respected by both men and women and they should have the support of their relatives. Often, single women are selected because of their greater freedom of movement. A strong personality and experience with organizational work are also advantages.

Several women on a committee can give one another mutual support (Hannan, 1984). Attendance of the first meetings by an extension worker, who may need to be a woman, also gives support (Kirimbai, 1985; Soon, 1983; Tanzania et al., 1982). However, in many cases, women representatives will need special training, particularly in leadership skills,

confidence building and communication with those they represent (Gordon, 1982; Seslar Svendsen and Wijetilleke, 1983; Tanzania et al., 1983). Similarly, training must be given to the men to prevent them from feeling passed by (Souza, ca. 1997; Gordon, 1982; Jackson and Palmer, 1983).

In areas with strong gender segregation, a gender approach is more generally practised through parallel organization of men and women (Hannan, 1984; Muller, 1983). In parts of Melanesia and West Africa, for example, women's organizations have a long tradition and considerable status in women's issues, such as health, cleaning and village beautification (Fanamanu and Vaipulu, 1966; Schoeffel, 1982) and financing of women's activities through e.g. savings and loan associations (Boesveld, 1982; Soon, 1983). New women's organizations or committees have been established with the aid of women fieldworkers and the support of local men (Azad and UNICEF, 1983; Jilani, 1985).

4.2.2 Implementation of water supply projects

Household contributions to construction

In a demand-based approach, the users are often asked to contribute to the construction of the system. Contributions may be in the form of labour, for example for site clearing and trench or well digging, or cash contributions towards local investment costs, the connection to the system, or a revolving fund from which running costs are paid. Paid local labour is also recruited during this phase.

In Latin America, contributions from future user households have meant cost reductions to agencies in the range of 3 percent to 40 percent (Cox and Annis, 1982; Mora and Salazar, 1979; Saunders, 1976), the highest being for construction of gravity systems which are labour-intensive. In Africa and Asia, values have ranged from 14 percent to 44 percent of the total cost (Feachem et al., 1978; Mbithi and Rasmussen, 1977; Miller, 1978; Msukwa and Chirwa, 1981; Whiting and Kristall, undated; Glasgow, 1983). From these savings, the extra input required for organization and supervision needs to be deducted. Because the cost of these inputs is seldom monitored, little information is available. However, evaluations in Cameroon (Müller, 1978) and Zambia (Bamberger et al., 1982) have estimated the average cost to be one-third of the value of the community contribution.

Gender balance in work and benefits

In regions where women do most of the agricultural work, they have also provided most of the labour contributions to water projects (Edwards et al., 1989; Fernando, undated; Olsson et al., 1991). Even in the Upper Region of Ghana and in Mauritania, both of which have a strong Muslim influence, women have contributed unskilled labour to water projects (Jackson and Palmer, 1983; Theunynck and Dia, 1981). In areas with a different gender culture, men will do the digging and women and children the transporting, the catering or organize other support activities, such as bazaars and lotteries (Abeywardena, 1977; Jaeger and Mattson, 1989; Mc Eachem et al., 1983; NCU, 1991)

Women's share in physical work does not necessarily imply that they have an equitable share in making decisions. A study of 311 self-help projects in Kenya found that 41 percent of contributors were women, and that they contributed most of the labour (5,000 hours in two water projects alone). In contrast, only 6-7 percent of the leaders were women (Mbithi and Rasmussen, 1977). In Tanzania, the women in Misalai community used the Kibwebwe dance as a culturally accepted means to express their dissatisfaction on gender divisions. They had volunteered to dig the trenches of a water supply and had turned out in higher numbers than the men. But when the pipes were laid and the water was connected, the ones with connections were the government leaders. The women were saying that unless this issue was solved they would no longer turn up for development work (Mlama, 1994: 62). The same situation goes for other projects. In spite of their active participation in physical work, participation of women in local decisions and management was minimal in projects in, for example, Honduras (Espejo et al., 1993), Niger (Groote, 1990), Tanzania (Binamungu, 1994), Thailand (Tunyavanich et al., 1987) and Zimbabwe (NCU, 1991).

A greater role in management following construction work has been found in areas with male migration and in projects with a conscious gender strategy. In Lesotho, women not only do most of the digging, but also most of the management, since many of the men work as migrant labour in South Africa (Mokohoane, undated; Worldwater, 1983). A question is whether the men will accept leaving or sharing the management with the women once they return. In other countries, such as Mozambique and Vietnam, male acceptance of an equivalent role for women was high during the time of war and political crisis, but disappeared after the situation had stabilized (Hasna, 1986; Hitchcox, 1992).

It is also not clear to what extent the greater roles in management have increased the women's workload, or how this increase is related to the benefits. In Ethiopia, the national women's association has assisted women to become involved in more than just digging (Haile, 1981). In Dodoto region, 100 women have been trained in management and technical skills, and have gained practical experience in technology and management during the construction of a gravity supply scheme for 48 villages (Wolde, 1984). How much extra work this involves, and whether the results warrant the inputs, has not been assessed. There are indications that participation increases the burden on women (Yacoob and Walker, 1991) On the other hand, women themselves have found this a lesser problem as long as they had influence on the water system (Whitaker, undated). When given the opportunity to make an informed choice, women have also tended to choose those women for maintenance and management positions who had enough time, freedom and respect to do the job without being overburdened (Wijk, 1985).

Sharing work between men and women is not restricted to household contributions during construction. Other forms occur in food for work programmes and infrastructure building by the private sector.

Food for Work. Women have constituted a high proportion of the labour force in such projects: for example some 80 percent in infrastructural projects in Lesotho (Nook et al.,

1983) and Ethiopia (Holder et al., 1982). In Bangladesh one third of the wheat distributed in food for work went to women workers (Marum and Kaneez, 1981). In Tanzania more women wanted to join, but the management and male village leaders thought the work too strenuous. Nevertheless the women that did join were given all kinds of tasks to perform (Tomoda et al., 1987).

Evaluations in Bangladesh and Tanzania showed that most of the women participating in such projects belong to poor and often landless households. Many of them are single parents (Chen and Ghuznavi, 1977; Tomoda et al., 1987). These findings have led to a limited number of separate projects for women, with rates of work adapted to their physical capacity. Other requirements are a more equal employment, basic provisions at the work site, including crèches and latrines, and training for more permanent jobs (Marum and Kaneez, 1981; Tomoda et al., 1987).

In addition, structural changes have been recommended, such as a more realistic national price policy for local food crops to stimulate production and reduce the need for food aid, long-term agricultural development inputs (Euronaid, 1984).

Private sector. Strategy documents for drinking water supply and sanitation stress the efficiency of the private sector, but without considering gender. Two gender aspects that show up in accounts of water supply construction are gender in labour participation and labour control. Particularly in Asia, labour participation of women in the private infrastructure is high. Actual participation is higher, because many women work gangs are registered in the name of the male leader (Dhjamia, 1983). In India poor women in particular work as unskilled construction labour, such as mason helpers (Kurup et al., 1996). Of the women employed on infrastructural works in Maharashstra, India, 80 percent were landless or marginal farmers, 18 percent were heads of household, and 40 percent were the family breadwinners (ISS, 1979).

Quality control. Gender interest in construction is not limited to labour participation. Future users and rate payers of improved water systems also have a direct interest in the quality of the work. Where agencies have acknowledged such interests and users knew what to look for, they have followed closely all local construction work by contractors (Cumberlege, 1993; Williams, 1980; Kelles, 1983). Referring to the practice of local workmen and supervisors to take their cut of materials in a water supply and housing project in inner-city slums in Colombo, Sri Lanka, local management committees have demanded more control over construction. They commented that ‘even (sic) the women can tell that the cement mixer is putting in five cement to eight sand instead of five to three’ (UNICEF, 1983: 135). In fact, women were considered to be the most suitable to check quality of construction because they are home during the day, and can make arrangements to supervise the work.

4.2.3 Operation and maintenance

With decentralization to the lowest appropriate levels, many of the operation, maintenance and repair tasks are delegated to the communities. In the sharing of this work gender perceptions and relations have a strong influence. Initially the tasks have been seen as purely technical and a male prerogative (Poluha, 1993).

A wide variety of reasons have been put forward by men why women cannot take part in operation and maintenance (Harkness, 1983; Kelles, 1983). ‘Women do not want to do unpaid work’ [But do men?]. ‘They are often away at the market’ [But what about mobility of men?] ‘They are tied to the house and cannot report or go about the village’ [But they visit the water sources]. They are afraid to go out at night to repair a pump’ [But is that necessary?].

A review of the daily and monthly tasks of handpump caretakers and scheme attendants did not reveal any tasks that could not be done or organized by women(Wijk, 1985). The main problems reported in Bangladesh and Guinea Bissau were that bolts were not fastened and bearings not oiled (Germany and UNICEF, 1983; Ploeg, 1980). Nor should the physical strength of rural women accustomed to heavy work in agriculture and food processing be underestimated. Take the above-mentioned food-for-work programme in Tanzania, where project managers hired fewer women than men, at a lower rate and for female tasks, because they are considered as the weaker sex. In practice the women did all work at the work site, irrespective of its arduousness, and were keen to be trained for maintenance (Tomoda et al., 1987). With the correct tools and training, they should be able to do all regular maintenance tasks, and can obtain assistance from others for the occasional heavier task. New light-weight handpumps that allow internal parts to be replaced through the top of the pump head also facilitate maintenance by women (Iddamalgoda and Dharmasili, 1987; Mauluka, 1981; Srivastava, 1990, 1991 and Figure 11).

Figure 11. Participation of women in local maintenance: a woman caretaker repairs one of the many handpumps in Bangladesh (IRC photo by Akil Khan).

Neither do all men have more technical experience than women. Many men trained in handpump maintenance in Upper Region, Ghana had no previous technical know-how and experience (Harkness, 1983). A study in four villages in Sri Lanka revealed that a considerable proportion of women has used screwdrivers and spanners (Gunaratne, 1976). Female familiarity with tools and construction is also reported from Tanzania (Drangert, 1993).

Opinions that women cannot perform maintenance and repair tasks thus seem to be based more on stereotyped gender concepts than on any real inabilities. Confronting such gender stereotypes, Wijk (1985: 33) quotes nine publications which demonstrate that women may well make better maintenance and repair workers than men. The reasons advanced are the direct concern and personal interest of women in their water supply; their regular visits to distribution points; the compatibility of preventive maintenance and user education with women's gender-specific tasks; the easier communication between female maintenance staff and female users; women's greater sensitivity to social pressure from other women to do a good job; the importance of health aspects; the lower career orientation and labour mobility of women; and training of women in modern technology in recognition of their age-old management of the domestic water systems.

Recognising the value of a gender approach, most programmes now also involve women in local maintenance. Here a distinction must be made between voluntary maintenance jobs ('caretaking') and paid jobs (mechanics or similar functions). Patterns that occur are that both women and men are caretakers and both do the same work; that a man and woman work as a caretaking team; that only women are caretakers, while the men have the paid jobs of mechanic, etc. and that mechanics' jobs are taken up by women as well as men.

The more common situation is that women become voluntary caretakers of the waterpoints in their neighbourhoods. As such they have mainly environmental and preventive tasks: keeping the sites clean and dry, avoiding water pollution and wastage, reducing misuse and vandalism, especially from children, diagnosing and reporting problems. The work is mainly physical. Training, if given, tends to focus on health and hygiene, rather than on technical know-how for early diagnosis and preventive maintenance.

Looking at this development from a gender perspective of male-female division of work, jobs, training and decision making discussed in Chapter 1, several imbalances meet the eye. It appears that for work in maintenance, both villagers and agencies use the prevailing gender patterns to give voluntary tasks of cleaning, prevention and reporting to women only, under the guise of 'involving women in maintenance'. In planning discussions on maintenance in Malawi, for example, the villagers did not question that women should be involved, but questioned why there should be men (Mauluka, 1981). Similar situations have been reported by projects in Guinea Bissau (Visscher, 1982), Togo (Hoffman, 1984; Pillsbury et al., 1988), Indonesia (McGowan et al., 1991), the Philippines (Ybañez, ca. 1995) and in several states of India (author's personal experience). Madsen, in Zimbabwe in 1988, reports the same, remarking that women '…have neither enough time nor income to work as voluntary caretakers'. From Bhutan come cases of local committees pressurising women into voluntary maintenance (EU et al., 1995).

Training for all tasks is sometimes related to the absence of men. Lesotho has many female caretakers because many adult males work in South Africa (Clark, 1982; Gray, 1982). In Kenya and Sudan the projects changed to training women who farm in the villages, because male caretakers were frequently away from the village (Hoffman, 1992; Sclafani, 1981). Also elsewhere male migration and mobility are reasons to train women (Munthali and Kamwanja, 1981; NCU, 1991). Women are also trained for all tasks when water supply is part of a women's programme (Wijk, 1985).

The physical work required in caretaking is often daily and adds to the workload of the women concerned. As seen in Chapter Three, this load is often higher than that of men. Despite their heavy workload, the indications are that, where both men and women work as caretakers, women are more stable and effective in their work than men (Binamungu, 1994; Devadas, 1984). Men travelled more and lost interest when the novelty of the function wore off (DHV, 1982; Gopalakrishnan, 1984; Visscher and Werff, 1995). It is likely however, that the reason is not that men cannot contribute to caretaking, but that the

selection criteria were wrong (young, technically oriented males, whose ultimate aim was a government job) the gender angle of maintenance was not considered.

The imbalance increases when work done by women is voluntary, while the same or similar work by men is paid. In Samoa, indigenous water sources were managed by women's groups on a voluntary basis, under the supervision of an older public health nurse. When the public health policy was changed, the women's work was not recognized but taken over by salaried male health inspectors. The result was that environmental conditions deteriorated, at a higher cost to the government (Schoeffel, 1982). Similar tendencies are reported in Kenya and India. In Western Province, Kenya, the project replaced paid repairmen by voluntary women pump attendants for reasons of misconduct and because the men moved to town (Finnida et al., 1987; Hoffman, 1992). In Rajasthan the project trained male mechanics, but also 72 female mechanics (Datta and Friese, 1993). The women did not get the same working and payment conditions as the men and the local councils have not agreed to take on the payment of their salaries (CDS, 1994). Similar reports on women trained and doing the work, but not being recognized comes from Karnataka, India (Devi, 19988).

A further gender analysis aspect relates to the division of paid work within the household. In other words, who holds the job and get the training and who does the actual work. It seems that, especially where male staff live on location, such as operators, and can also earn income elsewhere, they tend to delegate part of their on-site work to an untrained wife or daughter (Kelles, 1983; Kumar, 1989; Ma and Elmendorf, 1984).Training and job go to the former, while the actual work is done by the latter, often without sufficient understanding and skills. On the other hand, in Bangladesh, where women were trained, interviews revealed that, contrary to expectations, only 8 percent received help from husbands or sons. If male relatives helped, it was mainly in travelling to buy spare parts (Ma and Elmendorf, 1984).

In the last decade, women have had better opportunities to be trained for maintenance jobs that go beyond cleaning and reporting and are paid. In particular, women handpump mechanics have become more prevalent. What the effects are of maintenance by women on the one hand, or men on the other, have on the condition and performance of the water system, and on the workers themselves, has not yet been researched extensively. Available research tends to indicate that women perform technically as well or better, and that the costs of maintenance to the agency are lowered. This is reported, for example, by projects in Tanzania, Bangladesh, Zimbabwe and Uttar Pradesh in India (Binamungu, 1994; Hoque et al., 1994; INSTRAW and UNICEF, 1988; Madsen, 1990; Sharma, 1989). In the case of Rajasthan reported above, both frequency and duration of handpump breakdown were lower for female than for male mechanics. However, the opportunity costs are high (Jonsson and Rudengren, 1991; Madsen, 1988). In Rajasthan the amount of time the women spent on preventive maintenance was almost seven times higher than men. Having still to carry out their domestic work, they also face a double workload.

In Bangladesh two separate handpump programmes were evaluated gender-specifically. The study team visited a sample of 324 handpumps maintained by men and 148 maintained by women. They found that 12 out of 256, or 4.7 percent, of the pumps maintained by men, and 4 out of 121, or 3.3 percent out of those maintained by women, were not functioning. Over the previous two years, 68, or 21 percent of the male-maintained pumps, and 27, or 18 percent, of the female-maintained pumps, had had a breakdown time of more than six months.

The reported frequency of breakdowns was significantly lower for the pumps maintained by the women . The reported duration of breakdown was also lower, but not significantly. Eleven percent more women than men cleaned the platform regularly. Of those who did this every day, twice as many were women. The views of the male caretakers coincided with the findings of the study. Almost three-quarters thought that women would be as effective as men at pump maintenance (Micro, 1984).

These findings, while interesting, should be viewed with caution because they are based on recall of experience over a period of two years and not on monitoring. Also, more than 80 percent of handpumps were located either on the land or in the house of the caretakers. A possible distorting factor is also the age of the pumps, which was not taken into account in the analysis.

4.2.4 Gender in managing water supply services

The new policy framework for water resources development and management advocates that all management takes place at the lowest possible level. It also stresses that development and management must be holistic, because the various subsectors often share and have an impact on the same water resources and water demand in communities is holistic rather than sectoral. River basins are stressed as the most appropriate level for integrated water management. How is gender operationalized in the management of drinking water supply and in the more holistic management of water resources. And what is known of the effects on the water resource and on local men and women?

Men and women in community-managed services

In the past it has been quite uncommon to see both women and men on organizations that manage improved domestic water supply services. This is now rapidly changing. Female members of local management organizations are the result of appointments by local leaders or interventions by the programme agencies. Alternatively they are chosen by the men and women in the communities themselves. Reported experience suggest that the latter is more effective than the former. When the Gujarat Water Supply and Sewerage Board sent a government order to the formal village leaders that they should select women on the water committees, many of the women were only members on paper. The leader had passed their house and taken their name and thumbprint on an official paper, but they did not know what exactly they were supposed to do and had never taken part in any

management activities (R. Nanavatti, personal communication). The same is reported earlier in Maharashtra (Stanbury, 1984).

Where water committee members are chosen by their fellow men and women, formal barriers may impede the election of women. Because board members are usually chosen from association members, excellent women candidates who are not heads of household have been excluded. Both water supply and irrigation user associations in the Philippines had almost no women in decision making and managing functions, because only heads of household were permitted to be members of user associations (Cloud, 1994; Philippines, undated). Individual membership of user associations for male and female heads of households gives women a better guarantee of a voice in collective decisions and ensures that both men and women contribute to the service (Zwarteveen and Neupane, 1996). As one woman in a Mexican user association stated: 'Sometimes I think one way and my husband thinks differently. But both votes count' (Schmink, 1984: 6).

In projects in Malawi, India and Sri Lanka women have become members of mixed councils through the functional representation of chairpersons of local organizations, including women's party branches, traditional women's organizations and mothers' clubs (Clinard, 1966; Fernando, 1984; Kandawire, 1981). A disadvantage of this approach is that poor women are not always represented, either because they are not organized, or because their organizations are not recognized. Hale (1977) found that women from leading factions and high-income households dominated the women's clubs. Hannan (1984) reports the same. In more segregated cultures women and men tend to have separate management organizations (Wijk, 1985).

Effects of community management

What does gender-sensitive management mean for the management of the services and for the men and women themselves? Generally, reports indicate that women on local management organizations for water supply make special efforts to establish these services and keep them going. In Panama, 'each of the 26 communities visited had at least one woman on the water sub-committee….women had important roles in maintaining the water systems. In several communities that were having problems collecting water fees, women emerged as local leaders and successfully managed the collection process' (Meehan and Viveros, 1982: 8). Hecht (1995) and Kwaule (1994) also report more effective management. In the peri-urban water supply systems in Malawi women are the longest active members of all but three water management committees. Janssen, on the other hand, found no difference through gender factors when other conditions for good management, such as the presence of a service demand, an accepted pump location and proper selection and training of committee members were not in place (Janssen, 1988).

Nevertheless, as in planning, there are also accounts of female members as tokenism, who do not attend meetings and have no influence (Chachage et al., 1990; Groote, 1990; Kwaule, 1994; Madougou, 1995; Muller, 1991; Tanzania et al., 1983) or are replaced as soon as migrant husbands return (NCU, 1991). In the case reported by Fong et al. (1996:

35) female committee members mainly were given unskilled cleaning tasks. In general merely getting women on committees is not enough. In southern Tanzania female members did not take part in meetings until fieldstaff worked closer with the committees and a female staff member trained and supported the women members (Tanzania et al., 1983). In the New Delhi project reported on by Clinard (1966) the agency used gender-specific representation at three levels and special measures for easing women's attendance to get women involved at three levels of decision making. Training of men and women representatives included discussions on women and development. Women representatives also had separate meetings to discuss common issues and get training.

Experience with management by separate male and female committees varies as well. In villages in Pakistan women's committees did not come off the ground because the women had to travel, for which they had no time, means and permission. Other committees only met on the initiative of the men's committee (Azad and UNICEF, 1983). On the other hand, women's committees in Gezira and Kordofan in Sudan were said to function well, often better than those of men (INSTRAW and UNICEF, 1988; White, 1980). In a Mexican scheme women of the scheme's users' association established a separate Gran Commission, because they were dissatisfied with the work of the all-male executive committee running the water supply. As a result, local payment and scheme performance improved (Schmink, 1984). Both here and in Indonesia separate influence of women functioned well, apparently because the approach was not only culturally appropriate, but also chosen by the women themselves.

The effects of female participation in management on the women and men in communities are manifold. Recognition of women's management tasks and training for new tasks and skills have increased their status and self-confidence (Libatique, 1994). Women in Visayayas in the Philippines reported that their views are increasingly met with respect and their needs met with regard to time of meetings, design of water supply and design of latrines. They now believe that they can really contribute something for the good of the community and be 'partners in progress' and not be 'for decorative purposes only'. Some believe they are no longer subordinate to the men. Male and female leaders welcome their participation because women have a role in development and they need the women's capacities, though sometimes limited to traditional female roles (Ybañez, ca. 1995: 17-18).

In a project in Indonesia women grew in knowledge, self-confidence and leadership and autonomous management of water systems increased (Narayan, 1989). Special training gave female committee members in Malawi the confidence to take management decisions themselves. The committees with more women also managed a higher latrine coverage (896 latrines or 95 percent coverage), of which 68 percent were 'in satisfactory condition'. Under male leadership the result was 632 latrines or 67 percent coverage and 43 percent 'in satisfactory condition'. Other effects of the gender strategy were: more connections, better payment and management of payments and less water wastage and poor drainage at the communal waterpoints. There were, however, also negative effects: more tension between men and women and withdrawal of the men from their shared responsibility for a

community water supply (Kwaule, 1994). In New Delhi, 'many of the men eventually became reconciled to the participation of women inside or outside the project areas, and the women developed feelings of self-reliance…. Attitudes of older women changed to some extent, particularly in allowing their daughters and daughters-in-law to leave their houses to participate…' (Clinard, 1966: 272).

On the other hand, women still tend to take part in management only at the very lowest level, for example in tap and village committees. At the higher level, representatives are generally men. It is at this level that the more important management decisions are made, for example in a Sri Lanka programme (Kelles, 1983). Similarly, in Bhutan and Zimbabwe the district and ward committees in which the main decisions are made are exclusively male (Buringa and Lham, 1992; Olsson et al., 1990). Relegation of women to the lowest levels was not the case in an urban project in New Delhi which used layered representation. Women chose their own representative at the quarter and neighbourhood level. The levels consisted of 15 to 100 families and 250-400 families. Representatives from these levels were for the first time invited to civic functions and became members of neighbourhood councils which managed projects for 1,500 to 4,000 families. Two-third of these women attended higher level meetings occasionally and one-fifth regularly (Clinard, 1966).

Sometimes, agencies promote the management of water supplies exclusively by women and do not address male responsibilities and tasks (Gopalakrishnan, 1984; Janssen, 1988). It also occurs that project agencies pay so much attention to women's, as compared to men's involvement, that the service comes to be seen as a women's project, for which only the women are responsible (Oenga and Ikumi, 1991; Kinley, 1991a; Liao et al., 1994; Valera, 1987). Women's groups that build rainwater collection reservoirs at their members' houses also tend to finance these facilities single-handedly, for example in Kenya, Tonga and the Philippines (Cumberlege et al., 1994; Fleming, 1986; Libatique, 1994; Mbugua, 1994; Wacker, 1990 and Figure 12). In such cases projects cause women to carry the burden of a community water supply from which also male household members profit, irrespective of women's higher workload and lower resources. The decision to do it alone may, however, also stem from necessity or choice. In her analysis of 24 women's groups that build rainwater tanks in Kenya, Wacher found that half of the members were single parents and that the women feared to lose control when they were no longer solely in charge of all tasks. Reporting on her experiences, Kavita, in Boesveld, 1994, reports how women were only prepared to bring in the men when they felt they had enough skills and confidence. 'After about ten years of separate training and activities, the women felt that men should be equally involved. "What about our husbands?" they asked. "If we had been getting the training together with our men, we could have been sharing ideas, plans and development activities in our villages" (Boesveld, 1994: 20)'.

There are other cases where only women manage a water supply service. Women's organizations in low-income neighbourhoods in the capitals of Honduras and Kenya buy water in bulk from the town water supply and sell it through vending points to the

households. Although here, too, the women do not get support from the men, the difference is that the services bring them financial profit which they control themselves. In Nairobi, Kenya, the women use the water for beer brewing and tea stalls and depend no longer on private kioskholders who charge high prices. Women at the Kenyan coast use water and time gains for economic projects and use an unknown share of the profit to maintain the pumps (Narayan, 1988). In Honduras, the costs of ten litres of water became fixed at 10 cents while in the past private vendors had charged as much as 35 to 50 cents during the dry season (Elmendorf and Kruiderink, 1983).

No gender specific comparative field data

So far information on how men and women take part in water supply establishment and management and to what effect, exists mainly in the form of case studies. At the end of the 1970s, two large comparative field studies were carried out to assess the relation between the degree of community participation and management and the financial and technical performance of water supplies. The first was carried out by Imboden in 1977; Miller (1978) and Bennell (1979) analysed the data. Imboden compared 11 projects in 7 countries in Africa. While the degree of participation in planning, construction, maintenance and maintenance financing seemed to have no effect on the total percentage of facilities out of order, speed of repair was generally greater in schemes with community involvement.

Figure 12. Rainwater harvesting projects, such as here in Tonga, have tended to be women's rather than shared projects, with women groups doing all construction and financing (IRC photo by Akil Khan)

The second study took place in 137 rural water supplies in Mexico. It showed that with some form of participation in the preceding phases, 71 percent of the schemes were in working order when visited, against 51 percent of those without participation. Where users

But where both men and women pay within the household, a more balanced gender approach is also practised. In the rural water supply programme in Niger, for example, the policy is that all adult pay towards maintenance. However, the women pay one third of what is paid by the men. In Mali also all adults pay. Women generally pay half of the amount that men pay (Bolt, 1997). Villagers in Bomono-Gare, Cameroon used the same strategy and also charge more for higher volume use. Men pay 500 FCFA, women 300, but those making bricks, watering gardens or having water in the house pay a higher tariff. The most influential large users can however not be forced to pay (IRC, 1997).

Successful local payments also depend on the appropriateness of the local payment system for men as well as women (Wijk, 1994). Appropriateness can refer to the level of payment, the frequency, the location and the management. Some utilities and communities use a low 'social' tariff for the amount needed for drinking, cooking and basic hygiene and also have exemption rules. The higher tariff of larger users sometimes cross-subsidizes this social tariff.

Sometimes water supplies are not metered, or connections are shared, and so charging cannot be based on actual consumption. In those cases, local indicators of prosperity and household size and composition have been used to determine which households are large, medium or small water users (Wijk, 1987). In the Malawian neighbourhood connection system, two reasons why the users stopped paying their group's tariff were that they objected to the fixed opening hours and the flat rates within their groups. Some households consisted of a husband and wife with two or three small children, who only used water domestically. In others, there were two wives and a considerable number of older children, and the husband might drive a taxi which he washed every day. Yet both households would pay the same share of the group's water bill. Training of the tap committees on the possibility of adjusting opening hours and bill sharing to different demand and use patterns helped overcome these objections (IRC, 1986).

Participatory tools have helped households understand the need for payments and to decide on locally appropriate payment systems. In Colombia, CINARA has developed the 'bus game'. In this game the participants compare their water supply to a bus service, which needs payment for different items in order to run well, and where passengers pay according to their use. Social mapping is used to identify households of differential payment capacities (CINARA, forthcoming).

Agencies that respond to demand also adjust the frequency and location of payment to local conditions. Two reasons (but there are more) why the Grameen Bank in Bangladesh has such a good repayment record are that clients can pay in small amounts per week and to an agent in their own quarter (Yunus, 1985). Women, who are the major client group, find this quite convenient because they tend to earn a little money every day and have problems in moving too far from home (Stenvang et al., 1990). Elsewhere households have found it more convenient to pay after the harvest, or at other frequencies, depending on their particular flow of income (Wijk, 1987). In Karnataka, a water project uses

participatory rural appraisal techniques to assess such annual flows of work and income (Vyasulu, personal communication).

Especially when women make the payments, the location and method of fee collection is quite essential. In Kenya, Scotney (1977) found that the distances which women had to walk to the local water office were a constraint on the regularity of payments. This is perhaps the reason why, in many local water supplies, the water payments are collected at home and why this is done by women. Other reasons are that women make more reliable fund collectors and treasurers (Boesveld, 1994; Narayan, 1988; Niger, 1990, 1992) and that husbands prefer that, when they are absent, their wives are visited by female collectors (Wijk, 1985).

Preference for female treasurers is a widely reported phenomenon. Reports come from Central America (Espejo et al., 1993; Meehan et al., 1982; Schmink, 1984), Colombia (CINARA, 1990, 1994), Ethiopia (Poluha, 1980), Indonesia (Narayan, 1988, Sumbung, 1990), the Philippines (Valera, 1987), Kenya (Oenga and Ikumi, 1991), Tanzania (Mjenga et al., 1992), Sudan (Livingstone, 1994) and Mali and Togo (Bolt, 1997; Boucher, 1987). In Niger, a national seminar on management of rural water supply revealed that originally communities chose male business men as treasurers. When this gave rise to problems of mixing of financial interests and social obligations to provide loans to fellow men, women came to be chosen. Due to the positive experience with their commitment and honesty, the social handbook for community water supply now recommends choosing female treasurers for water committees. In Dosso province, where small towns supply water through vending at water kiosks, the vendeuses are also women.

While these women are paid a salary for their days' work, many treasurers on water committees are not paid. This is usually not different for male office holders. However, it does become an issue when the work of fee collection and financial management is very time consuming and strenuous. Women on water committees in Uganda remarked that the time they previously had to spend on water collection they now had to spend on fee collection (Yacoob and Walker, 1991). In a project in Indonesia women collected the water rates, but few had a role in financial decision making (McGowan et al., 1991). A gender comparison of the amount of work involved in the various tasks can reveal such inequities and lead to a fairer arrangement.

Where users pay for a service, accountability for proper delivery and management becomes very important. Where such accountability is not arranged for properly, the risk grows that users lose trust, especially when the service is not too regular. Users generally have little insight into the types and amount of expenditure required for water provision. Accounting for the amount of funds available, the ways they were spent and the performance of the system, as well as budgets and tariffs for covering next year's costs helps users gain better insight and contributes to a system of control and encourages trust (Wijk, 1985).

4.3.5 Public education

'Waste no water' education campaigns are undertaken in many forms, sometimes with and sometimes without attention to gender differences. In one of the early participatory rural water supply programmes in Africa, the piped gravity supply programme in Malawi, the men were encouraged to see that pipelines remained unharmed and covered during ploughing. Both men and women were encouraged to establish footpaths along pipeline routes so that leakages could be easily detected. Tap inaugurations included education on water loss and demonstration of washer replacement. Spare washers were at that time given to the male leaders only (Glennie, 1979). In greater Cairo, a public awareness programme used separate sessions for male local leaders and women to promote understanding of groundwater threats and enhance preventive action. The water agency must rely increasingly on groundwater because of high population growth and the limited availability and high treatment cost of surface water. The groundwater is currently polluted by leaky sewerage pipelines, trench sanitation, faulty shallow wells and high pesticide and fertilizer use. The meetings taught that people knew about the problems in general, but did not relate them to their own behaviour. The women were initially reluctant to attend and home calls were made to collect them. Once present and informed, they became very supportive. A jar with local well water left standing for impurities to settle proved a strong motivating tool. The meetings decided to share the cost of rehabilitating the sewerage plant, with the proviso the station was moved to the outskirts of the settled area. This was agreed to (Attia, 1996).

Public education and financial incentives also play a role in the adoption of water saving devices. A public campaign, targeted especially at consumers of 100 cubic meters or more, reduced water consumption in Bogor by 29 percent. The authorities in Mexico City replaced 350,000 toilets with smaller six-liter models. This saved enough water to meet the household needs of 250,000 more people. The use of water-saving devices was one of the measures that helped Jerusalem cut its per capita water use by 14 percent. In Waterloo, Canada, volunteers distributed water conservation kits to nearly 50,000 homes. Coupled with higher prices and education this brought water use per capita down by nearly 10 percent (World Bank, 1993: 53). Public education and promotion of water-saving shower heads and toilets in three years reduced water use in the Netherlands from 138 to 134 liters per household. One third of the households now have water saving shower heads and toilets (Achttienribbe, 1996). No information is given on whether these campaigns used a gender strategy to achieve these results.

4.4 Holistic water approaches, participation and gender

At community and area level, the development and management of the respective water services is still predominantly compartmentalized. There are some examples of water schemes designed and managed for multi-sector use. A number of irrigation schemes have been developed and are managed for productive as well as domestic water uses (Agarwal, 1981; Jayewardene and Kilkelly, 1983; Pacey, 1977; Palmer et al., 1983; Jayewardene and Kilkelly, 1983; Yoder, 1981).

Similarly some domestic water supplies take the productive use of drinking water by men and women into account. Domestic water supply schemes in drought and high-fluoride areas in India include provisions for cattle in their design criteria. Gender studies in these areas found that, while men owned the cattle and were members of milk cooperatives, women did much of the work (Jain, 1980; Madhavan et al., 1992; Mitra, 1983; Samakya, 1989). Organizations such as SEWA (Self Employed Women's Association), and the Dairy Cooperatives Union of Andhra Pradesh thereupon introduced special milk cooperatives for women. Generally, the cooperatives started and supported by this professional women's organizations have done better than those started by the Union (Schenk, 1990).

In principle, water resource development for multiple use should prevent conflicts between domestic and productive users. However, shortages of water and subsequent demand management have increased tensions and competition, as was discussed in section 2.3.1.

4.4.1 Integrated community management of water resources

A tendency to move back towards more holistic water management can be noted in some programmes at village level. In Nalgonda in Andhra Padesh, villages have been helped to map their various water resources and develop their own comprehensive water sources use and management plan (Bliek, 1994). NGOs in Kerala, India, have use participatory resource assessment techniques to inventorise problems and start action planning. However, government support was later withdrawn (Down to Earth, 1992). In Colombia, CINARA, a Latin American resource centre for the water and sanitation sector, has developed a participatory tool with which communities analyse water and land use by different groups in the catchment area and in the households and all locations in between. After the analysis the same tool is used to identify and plan improvements and monitor effects. The tool covers all possible forms of domestic and productive water and land uses by women and men (see Box 4).

Box 4. 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. These can be 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 (Antonio Rodriguez, CINARA, personal communication).

4.4.2 Water source protection and allocation

Success stories exist where, under strong local leadership, communities greatly improved the management of their water resources and catchment areas, or were able to protect the local water interests in the struggle between urban and rural water supplies. Sneha Palnitkar (1996) describes the work of the water committees in the drought-prone zone of Purandhar Taluka in Maharashtra State, India. Salient features are the conservation of water at village level, the use of the conserved water mainly for irrigation and the equitable use of water. Paani panchayats (water committees) bind themselves to several rules. A scheme benefits the whole community and not specific groups. Conserved water is redistributed at a rate sufficient to irrigate half an acre per person. Cultivation of crops that have high and long water requirements is not allowed. Landless villagers have the same right to water consumption.

Palnitkar (1996) also reports on a community-managed watershed development project in Ralegoan Shindi. Activities included planting 250 acres with 400,000 trees, constructing 44 runoff catchment systems, five above ground and three underground checkdams, and planting 400 acres of grass for fodder production. Groups of ten to twenty-five farmers unite in registered societies and dig and manage wells. Each household has a water ration card allowing it a turn in water allocation. One man or woman from each household contributes labour for construction and maintenance, or pays a fine of Rs.50. Taking into account an inflation of 10 percent per year, improved water availability and distribution has increased household incomes by more than Rs 1600, or USD 46 in 1997.

The approach in Ralegoan Shindi has been followed by Pimpalgaon Wagha, a drought-prone community in the same state. The highly deteriorated watershed conditions in this area had a heavy social toll. Water shortage affected agriculture, forestry and drinking water. Women walked for miles for drinking water and fuelwood. Parents kept girls from school to help. When crops failed, families temporarily migrated to town or became indebted to moneylenders. With the help of an NGO, the villagers formed a village watershed committee. It was based on geographic representation and thus represented poor, less poor and rich, as each category lives in its own hamlet. The committee issued a ban on free grazing and felling. The farmers adopted contour trenching and bunding. The villagers plugged gullies and constructed checkdams and percolation dams. Each family contributed two man-days of labour or the equivalent in wages. Women contributed labour for tree plantations. Cattle owners replaced scrub cattle by hybrid cattle and sold their goats. The impacts on the environment and socio-economy have been great. Poor households now take part in decisions. Soil covers and water levels have gone up. Where earlier 35 of the 70 irrigation wells went dry after 8 months, all now have water for up to 11 months. The women have got domestic wells in the village. They have set up their own revolving credit fund, making loans available to the needed at a low interest. Horticulture and a dairy cooperative could be started. Boys and girls who herded goats and helped mothers now attend school. The literacy rate has climbed to almost 80 percent (Lobo, 1995).

Water resources are also threatened by increasing competition between rural and urban areas for land and water. In the absence of equitable representation of the interests of all stakeholders, rural households have had to struggle for the preservation of the natural resources on which their livelihood depends. Sen Lingampally, in greater Hyderabad, is one such community. Its only permanent source of water is Gopi Cheruvu tank (rainwater reservoir) which serves people and cattle. A large construction company working in the area several times broke the bunds of the tank. Its aim was to drain the water and create a new building site. Spearheaded by the local youth, the tank users formed a society to save their tank. After much peaceful protest, the district administration ordered the company to leave and pay a penalty (Palnitkar, 1996).

How is gender present in the protection of water resources and their catchment areas? In her report from the Pimpalgaon Wagha, Souza (undated, ca. 1997) gives a detailed description of the different way women participate in and are affected by this programme vis-à-vis men. Using the gender analysis framework of Chapter 1, these roles and impacts can be classified as follows:

Paid and unpaid work

The opportunities for programme-paid work in catchment protection have increased for men and women. Women work especially in the nurseries for reforestation. Because the programme interventions bring better water retention, the agricultural season has lengthened. This development means labour opportunities in agriculture and in agro-

industries are also increasing. Work in natural resources collection is both increasing and decreasing. It is increasing for poor women because the ban on fuelwood collection hits them hardest. At the same time it reduces labour for the better off, who with the higher agricultural production have more cash to spend on buying wood or kerosene and more agricultural waste to use as fuel alternative.

Access to natural resources

Catchment protection measures have an influence on the availability of fuelwood, natural grazing and water. As with fuelwood, changes in natural grazing affect poor and better-off women and men differently. With a ban on free grazing, the poor, in particular the poor women, are forced to graze their family's animals outside the watershed or pay compensation for natural grazing. When they cannot meet the fodder requirements they have been forced to sell their animals. In the better-off families the availability of more fodder and water from better water retention and recharge and better regrowth of fodder grasses has stimulated the men to start zero-grazing. This increases their wives' work, as it is often they who collect the fodder and not their husbands. This is especially true of smallholders who have no means of transport.

Thanks to better water retention in the catchment areas availability of drinking water is also improving. As a result wells and other sources dry up later in the season and women have to walk less far to collect domestic water. The beneficiaries are especially women and girls, in middle-class households, who have no servants yet use more water. The poor also benefit, but to a lesser extent, as they use less water.

More trees are planted in the area. However, as in agriculture and animal husbandry, it is the men who decide on type of crop, method of animal raising and tree species. Since the men are particularly interested in trees for their market value, they will grow trees for timber, carpentry and other market purposes. Women's species choice is for the fuel, fodder and fruits.

Benefits

The greater availability of paid work for women and men and the higher productivity benefits the families as a whole. Migration of men or whole families in search of seasonal labour has dropped. This has a direct impact on family welfare and stability. Parents send their children to school because they now remain in the village all year round and have enough income to live on without extra earning by the children. With the ban on free grazing, boys no longer can herd cattle. Girls need to help less in water collection, since sources dry up less. More cash and a higher productivity are improving food security and nutrition.

There are also specific benefits for women. The fact that they now earn income has improved their status in their own eyes and in the eyes of their husbands and is giving them more influence in domestic decision making. The better water supply situation saves women time and energy and the government the cost of tanker supply. This has enabled

the women to take up health education and organize savings and loan groups, where some extra inputs (group organization, health education) have been made available. Because they operate in a group and have their own income, they more easily get banking facilities and loans and are gradually becoming less dependent on private moneylenders who exploit them. The economic and social changes also make women become gradually accepted in public decision making. 'Wherever men leaders have been encouraged and nudged to give greater space to women – and this is possible since women contribute the bulk of the labour force (60 to 70 percent on an average), earn a regular income and are responsible for about 70 percent of farm chores – women gradually and non-conflictually are being inserted into the institutional decision-making mechanisms of the village and the watershed development effort' (Souza, ca. 1997: 9).

Division and control of benefits within the home

The positions of women and men have thus improved, but in general the share of the woman in the workload is bigger than that of her husband, since in addition to the 7-8 hours in productive labour, either in the household enterprise or in paid labour, she still has all domestic chores to do. This normally brings her workday to 16-18 hours. She also has less time for the children, which the fathers will not substitute.

In the household, the men further decide what types of crops will be grown on the farm. Where water availability in the soil has increased, the male farmers have tended to go in for cash crops instead of food crops. This means that the women can no longer use part of the food crop for home consumption and have to purchase food elsewhere. This is normally done and paid for by the women, since the men are not used to having the responsibility for food supply. It results in a decline in women's financial position and, in a number of instances, a lower quality family diet. Moreover, the increased growing of cash crops depletes the improved water availability, so that domestic water supply, which had just improved, is again under threat, with negative consequences for the girls and women.

Nutrition and education are two other area where benefits get divided inequitably. Although parents want benefits to reach the children in particular, it is still common in the villages that boys get preference over girls in both nutrition and education. Thus, while the absolute level for both increases, boys gain relatively far more than girls. When a drought returns or incomes drop for other reasons, girls are the first victims, as they are the first to be withdrawn from school and have their nutritional intake reduced and the last to see their health problems attended.

The benefit most valued by women as well as men is undoubtedly the increased income. Yet women who earn this income do not always have, or share, control over how this income is spent. The author reports cases where men impound their wives' earnings or pressurise them to liquidise their savings so as to purchase assets which the husbands will own and control, or use the money for other personal interests.

While direct benefits are thus great, it is the disbalance in control over these benefits – food, money, education – which means that the developmental benefits from the improved management of catchment areas which are so essential for the long term – better water management, healthier families, better educated women and girls, slower population growth – are not yet forthcoming. It is precisely these longer-term benefits that require strengthening of gender awareness and a gender approach in the households, the villages and the programme.

5. Cinderella and the Missing Slipper: Sanitation and Gender

Sanitation is sometimes called the Cinderella of the drinking water sector: the poor relative in a German fairy tale who comes second place and must remain out of sight. Yet better sanitation has large environmental, socio-economic and health benefits. To enhance sanitation, agencies are shifting from a supply-driven to a demand-responsive approach, focusing directly on households or helping communities establish local sanitation management programmes. If sanitation is the poor relative, gender is her missing slipper and the key to the fairy tale's happy end. This chapter reviews where and how sanitation programmes have included gender elements and to what effect.

5.1 Sanitation stays behind

Sanitation, as defined during the International Drinking Water Supply and Sanitation Decade (1981-1990) comprises 'the sanitary disposal of [human] excreta and wastewater' (UN, 1990b: 1). Although more comprehensive definitions exist, with respect to gender most experiences have been gained in the areas of off-site and especially on-site human excreta disposal. Hence this chapter focuses on sanitation in this particular sense.

Comparison of the situation at the beginning and end of the Decade shows that progress in improving sanitation has lagged behind that of water supply. The sanitation gap will have grown larger by the turn of the century (Figure 14).

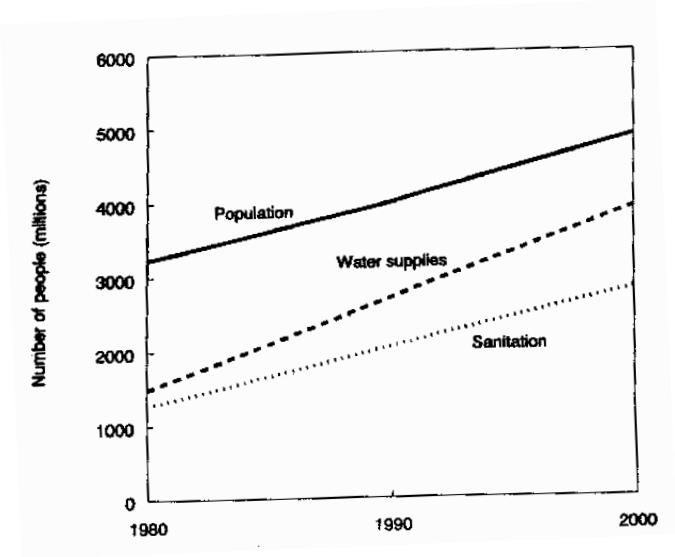

Figure 14. Coverage of sanitation and water supplies by population from 1980 to 2000 (estimated) (source: Esrey, 1994)

Having no proper means for excreta disposal is a great inconvenience. Women and girls in particular face problems of distance, lack of privacy and personal safety (Elmendorf, 1980; Kurup et al., 1996; Mukherjee, 1990; Wijk, 1985: 24; World Bank, 1990). Poor sanitation is also a serious threat to the cleanliness of the environment and the water resources used for the supply of drinking water. Lack of proper sanitation has led to high loads of bacteriological contaminants in surface water resources. In India, estimates are that 70 percent of the surface waters are polluted. Water quality monitoring in China showed that 54 of the 78 major rivers are seriously polluted by human and industrial waste (UN, 1990b). In Nepal, the Kathmandu Valley is known for having one of the worst sanitation conditions of the continent (Thacher, 1993). Groundwater aquifers are also vulnerable to pollution from human waste, since they are recharged from the surface. Since groundwater is slow to accumulate, contaminants are also slow to move out.

Improvements in water supply, sanitation and hygiene do not have the same degree of impact on human health. This goes in particular for diarrhoeal diseases. Diarrhoeas are the most prevalent water and sanitation disease and the first cause of mortality for children below five years of age (WHO, 1993). Preventing human excreta from entering the environment through better means of excreta disposal is the most effective solution for the prevention of diarrhoeas (Figure 15) this has in turn a beneficial impact on especially children's development (Daniels et al., 1991).

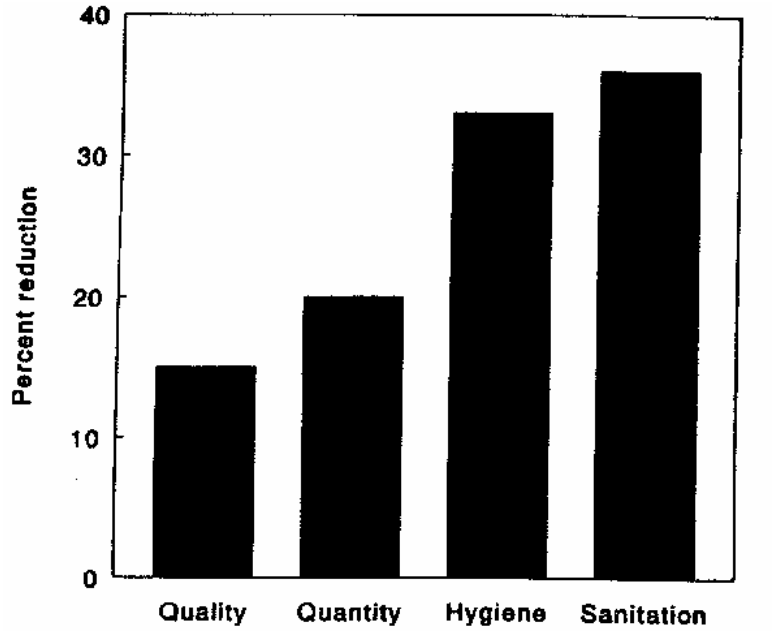

Figure 15. Reduction in diarrhoea incidence by type of intervention (source: Esrey, 1994)

The figure shows that improved sanitation brings the largest reduction in diarrhoeal diseases. The reason is that the pathogens no longer enter the environment. The second largest reduction comes from better hygiene, especially washing of hands. Pathogens that

could transmit diarrhoeas via the faecal-oral route are washed off before they can do any harm. The use of more water for general hygiene is the next most effective, followed by the improved quality of drinking water. The fact that many routes other than drinking water can transmit diarrhoeas explains the relatively low effectiveness of improved water quality. Improved sanitation and hygiene reduce morbidity from diarrhoeas by 33-36 percent, mortality from diarrhoeas by 65 percent and mortality from the total of water and sanitation related diseases by 60 percent (Esrey, 1994).

5.2 Closing the sanitation gap

Sanitation programmes, which aim at closing the sanitation gap, have initially been supply-driven and construction-oriented. Agencies have chosen a sanitation technology based on various considerations and then set targets for construction. Since interest in sanitation tends to be lower than interest in water supply (Dian Desa, ca. 1990; Helvetas, 1991; Hoque et al., 1994; Laubjerg, 1984), implementers have promoted their programme through health information and subsidies. Sometimes they have made latrine installation a condition for water supply (Almedom and Chatterjee, 1995; Boot, 1995; Graham, 1990; Murphy and Perez, 1994; Smet et al., 1993; Williamson, 1984). Generally, the early latrine programmes benefited the better off: there is a high correlation between latrine ownership and socio-economic status (Almedon and Chatterjee, 1995; Azad and UNICEF, 1983; Chen, 1969; Sundararaman, 1986; Schaik et al., 1995; Therkildsen and Laubjerg, 1982; Tiglao, 1963).

Heavy subsidies make interventions costly and affect both the scope and the sustainability of the programmes (WSSCC, 1994). In the 1980s the Waning'ombe rural sanitation programme in Tanzania was considered an example of a highly successful programme (Wright, 1983). Replication of this programme in the other regions of the country would, at that time, have cost 500 million Tanzanian shillings in subsidy, additional costs in labour and materials of 10,000 million shillings, a total of 2.5 million baked bricks, with grave consequences for forest coverage and women's fuelwood collection, and 7500 kilometres of imported PVC pipe for the ventpipes (Lium, 1983).

In India, a national sanitation programme installs double-vault, pour-flush latrines with a subsidy of 80 percent. Between 1980 and 1992 the programme has managed to raise rural latrine coverage from 0.5 to 2.7 percent. Another 8 percent had installed a latrine through the private sector (Ministry of Rural Development, 1992). High subsidies are also reported in Botswana. In 1992, ventilated improved pit latrines, including overheads, cost USD 200 each. Of this the households pay USD 15, or 7,5% (Rajeswary, 1992).

In comparison, Bangladesh, with simple technologies and low subsidies, but a strong promotion strategy, has achieved a latrine coverage of 70 percent in the districts with an intensive demand creation strategy (UNICEF, 1993). Households install either homemade pit latrines or water seal latrines. They buy latrine parts in Village Sanitation Centres or Marts. In seven years' time, 1000 such centres were established and each district now has

one. Seeing the demand for sanitation, some 700 private entrepreneurs have also started sanitation marts. Having a 14 percent lower production cost than government centres, the private producers sell the latrines at the same price. In a few cases they also provide limited credit. NGOs, notably the Grameen Bank, have stopped their own latrine manufacturing programmes and assisted its members to buy instead from local producers at an unsubsidised rate. With an annual growth rate of 60 percent per year, full coverage should be possible by the turn of the century (Chandha and Strauss, undated; Ikin, 1994; Luong, 1994; Brandberg, 1993).

Sanitation programmes which rely mainly on sources of financing and implementation from outside the communities have a low level of sustainability. In this respect, rural sanitation differs from rural water supply. A new water supply can, when designed, installed, maintained and managed, serve a growing population for ten to thirty years. A latrine programme's coverage goes down the moment construction ends, unless capacity is developed through which new households build and use latrines with their own resources.

5.2.1 The changing nature of sanitation programmes

In response to the above situation, a number of sanitation programmes now focus on creating the conditions under which self-sustaining local sanitation programmes emerge which respond to demand. Direct external subsidies for household facilities are absent or phased out. Financing goes to promotion, to the development of a range of models adjusted to differences in economic demand, and to training, monitoring and evaluation. Agency staff and community members work together to mobilize sanitation demand or create demand where it does not yet exist (Alferink, 1995). The overall objective is to develop a strategy for improving sanitation which, once established, households, communities and the private sector will sustain by themselves. The agency can then move on to other areas to replicate the approach (Samanta and Wijk, 1998).

Demand-responsive programmes

There are a number of sanitation programmes which are more demand responsive than supply driven. An important aspect of Lesotho's national rural and urban sanitation programme, which began in 1983, is its private sector orientation. Interested candidates can come forward to be trained as self-employed latrine masons. One in four trainees are female. Apart from their technical training they also learn to create demand and keep an administration. Other key principles are assessing preferred design, no subsidy, strong promotion and a proper institutional base. Householders using the masons' services pay for all direct costs, including materials and labour. The programme bears the costs of training and of making the programme known (Blackett, 1994; UNDP/World Bank, 1990).

Households in Dosso in Niger can choose between improved pit latrines and 'sanplats'. Sanplats are concave small-size latrine slabs, which are placed over the latrine pit. When the pit is full, either it is emptied or four people shift the slab to a new pit. The old pit is covered with soil. The households dig the pit, make the bricks, pay the mason and collect

or buy the local materials. The programme provides the mould for the bricks and training for the masons and monitors maintenance and use for the first period after the installation. In Dosso the programme provides a bag of cement and iron rods for reinforcement. The approach has since become so popular that in the neighbouring province a subsidy in kind is no longer necessary. Being a semi-desert region, most households prefer to have an open-air latrine surrounded by a clay modesty wall. So many households installed a combination of a latrine and improved shower (cemented floor with drain and soakpit) that the programme now promotes this bathroom concept as a package (Nibakure and Wijk, 1996).

An NGO, Rama Krishna Mission, implements the sanitation programme in West Bengal, India. Households get a choice of twelve latrine options. None have a subsidy. The core of the programme are the local youth clubs. Each youth club has 1 or 2 members trained as masons and another group as sanitation mobilizers (1 per 200 families). The mobilizers pay home visits to promote latrines and other sanitation facilities. For each installed latrine they get Rs. 30, or USD 1 in 1997. The cost of the cheapest latrine is Rs. 250, or USD 8. The most expensive one is Rs. 3000. For further promotion, the programme organizes group meetings and mass evening assemblies. A support unit at cluster level (programme villages are grouped into clusters) gives training to the masons and mobilizers, provides information materials, organizes assemblies and procures the construction materials for the groups. Households wishing to install a latrine or other sanitation facility pay the fee to the youth group. The fee covers the direct costs of the latrine. Overhead costs are paid by UNICEF and state and central government (Chakraborty, 1993).

In Kerala, panchayats (communities) that want the Socio Economic Units Foundation (SEUF) sanitation programme have to establish a sanitation fund. Other contributors to the fund are the households and external donors through the SEUF. Only households with an income below the poverty line (on average USD 26 per month in 1996) can apply for a latrine subsidised by the fund. Others have to pay the full costs. Male masons trained by the programme as latrine builders work as private craftsmen, while women masons and blockmakers work in a cooperative. Latrine costs have been brought down and the share of low-income households in the investment has grown from 25 percent to 40 percent. A further growth of local cost sharing to 75 percent is envisaged (Kurup et al., 1996, Rural Development Department, 1997).

The cost of latrines was not an overriding factor for those rural households in Botswana who built a latrine with their own means. Households in the Self Help Sanitation Project invested on average USD 110 per latrine, far exceeding any estimates of willingness and ability to pay (LaFond, 1994) and in sharp contrast to experiences with a supply-driven strategy.

Examples of demand-based sewerage programmes are the Orangi programme in Karachi (IRC, 1988; Khan, 1983, 1985, 1992, see also Box 5), the Kumasi Strategic Sanitation Programme in Ghana (Alferink, 1995), the sewerage programme in Colombo, Sri Lanka

(Sevanatha, 1993) and the condominium programme in Brazil. The latter also includes a solid waste collection and recycling component (Arrais, 1994). Tunesia has adopted a range of six alternatives to match supply with demand (Bendahmane, 1992).

Roles division and technology choice

In demand-responsive programmes such as those quoted above, the agency provides the 'enabling environment': preparation of the design range (often based on local assessment of what aspiring user categories demand, see Section 5.2.2), training of local mobilizers and constructors (often private sector), supply of key equipment like moulds, provision of the information and promotion, monitoring and evaluation of the installed facilities, and developing the general approach. The households and local craftsmen, and sometimes the council or sanitation committee, do the implementation. Direct costs of installation are either fully or largely borne by the beneficiary households. They usually get a choice of technology and design, to match varying demand (Alferink, 1995). Assessment of the resources available in households and agencies helps in offering a range of options that match the capacities and demands of all parties involved (Larbi, 1990).

Box 5. Orangi sewerage project in Karachi, Pakistan

Akhter Hameed Khan, a Karachi architect, set up the Orangi project in 1981. He considers the project as a research undertaking, which aims to discover the problems and find solutions through action research. The main activity of the project is to construct sewage lines in the squatter area of Orangi. First the social mobilizers of the programme go to the residents and inform them about the low-cost sanitation programme. They bring plastic models of a pour-flush latrine connected to a sewer to explain the system. They also show slides of the construction in the lanes. The mobilizers explain that if the residents want a sewerage system in their lane, Orangi Pilot Project (OPP) will arrange for a survey and a plan and will give the residents an estimate of the costs. OPP also provides technical training to the lane managers, lends them trolleys for transport and tools for digging and hires an experienced plumber and mason to supervise the work. The lane managers hold meetings with the lane residents, create consensus, settle disputes, collect household payments and supervise the work. The residents provide the full cost of material and labour and have to organize and execute the work by themselves. In 1991, the cost of the latrine, the sewerage connection and the share of the secondary sewer was Rs.1000 (USD 70) per household. The GNP per capita was USD 370. From 1980 to 1985, 41 percent of the more than 3,000 lanes and 47 percent of the more than 43,000 houses got a sewerage line and connection (Alferink, 1995: 33).

Two strategies: household mobilization and marketing and community managed sanitation

In operationalizing a demand-responsive approach, two general strategies can be distinguished (Wijk and Murre, 1995; WHO, 1993). In the mobilization and marketing approach, the sanitation programme focuses directly on households. The programme creates all the necessary conditions, which enable households which have a latrine demand to meet this demand promptly and properly. It also spends much effort in finding

out what factors create a demand among the target groups and what channels of information reach and are valued by each target group: men and women from different age categories, with different marital and socio-economic positions and ethnic and religious backgrounds. Once the demand-raising factors of each category are known, the programme develops a tailor-made campaign to encourage demand from groups which have not yet improved their sanitation (Griffith, 1991; McKee, 1992; WHO, 1993).

In community-managed sanitation programmes, the agency assists a community institution, such as the local council, or water and sanitation committees, to organize and manage their own sanitation programme. In these programmes the local organization assesses who in which households want a latrine and promotes, or organizes the promotion of, demand in the other households. A gender approach ensures that the programme information reflects the differences in demand of women and men and reaches and mobilizes both categories. The community organization may manage the local sanitation fund and acquire materials in bulk. It also monitors progress and quality of construction, and the subsequent hygienic use and maintenance of the completed latrines (Kurup et al., 1996). Togone is one of the communities in Dosso, Niger, which manages its own programme. The community has seven neighbourhoods, or quartiers. One man and one woman from each quartier together form the community sanitation committee. The quartier representatives vie among themselves in improving environmental conditions in their neighbourhoods. The female members promote better sanitation among the women in their neighbourhoods, the males among the men. As few villagers are literate, they and the village organizations in the other villages use a map to record achievements (Figure 16). They have drawn these map themselves, using beans, pebbles and other natural resources to mark environmental sanitation and hygiene conditions and skills. A member of the programme staff subsequently transferred the maps to paper. Keeping the first map as a baseline, the village organizations mark each achievement during the 7-month annual cycle of the programme on a second map, to monitor progress and manage the programme. The women take part in sanitation management, but not yet on a fully equal footing with the men (Figure 16).

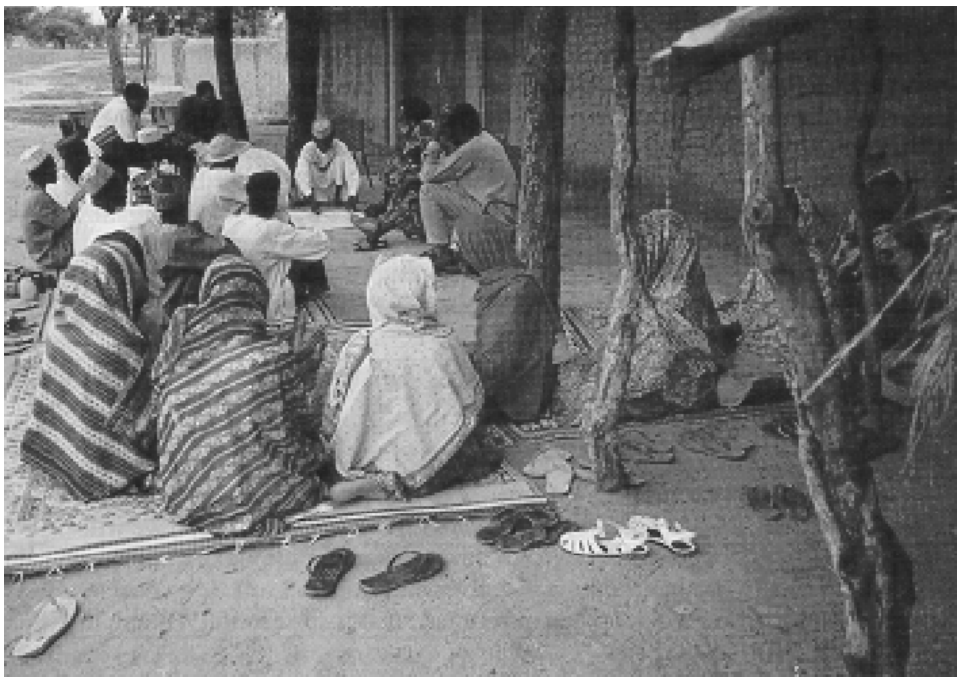

Figure 16. Using the village map as a management tool, the quartier committees discuss sanitation progress and gaps with the chief of the village (photo: C. Wijk)

5.2.2 Responding to and creating demand

The degree of demand for facilities to dispose of human excreta is strongly related to the local physical and socio-cultural environment. Demands increase when the local situation creates problems, or when potential users come into contact with attractive solutions elsewhere (Blackett, 1994; Bergh and Nordberg, 1996; Doucet, 1987; Dian Desa, ca. 1990; Elmendorf and McGarry, 1984; Mbere, 1983; PRG, 1980; Wellin, 1982). In Chitral, Pakistan, men learned about latrines when visiting the district capital. Women learned about them locally, but sometimes only when a latrine was actually built in their own house, as the programme did not involve women (Korput and Langendijk, 1993). Because men are less inconvenienced, and women have more problems with lack of privacy, distance and safety, women generally have a higher demand for latrines than men (Laubjerg, 1984; Kishwar and Barq, 1990; Mitra, 1984; Mukherjee, 1990; Shafiuddin and Bachman, 1983; Sundararaman, 1986).

After household surveys and meetings with both men and women, the initiative to purchase latrines has often come from women, as in a community campaign in Ainthapali, a rural village in Orissa, India (Kanungo, 1957). Other accounts of women initiators or motivators are given in latrine projects in Paraguay (Dick and Villar, 1984), India (Kurup et al., 1996), Indonesia (Evans and Appleton, 1993) and Pakistan (Bakhteari and Wegelin, 1992).

In communities in which local authorities are responsible for water and sanitation, women have petitioned successfully for improvements in sewerage, sanitation and waste removal (Chapman, 1981; Kaithatara, 1982; Yusuf, 1992). In one village, women dug several drainage pits in the main village street overnight to demonstrate their need. Thereupon the village drainage system was improved (Arole, 1984). In Madras, many slum areas were originally rural villages, which have been engulfed by the urbanisation process. Women in these areas contribute half the household income through petty trade and businesses. The establishment of women's loan groups by a women's organization has had both economic benefits (2,800 new jobs, average 50 percent increase in earnings) and social effects. Once united, the women promoted the construction of communal toilets for women in markets and other work places, and also better housing and latrine construction in the slums (Chen, 1983).
Women's demand for sanitation was expressed evocatively in a meeting in Chiuchin, Peru:

> 'We need a plaza, drainage and electricity. I think it would be best if we could create a committee of women with someone to advise us. It hurts me that my town is backward, that there isn't any progress. Soon we will need progress so that there is some advancement for the children, so there isn't so much unemployment. Everyone goes to Lima. It isn't possible that we will leave behind our land that is so beautiful' (Bourque and Warren, 1979: 128).

Raising demand

Environmental and public health authorities are preconditioned to address environmental sanitation conditions in areas where the risks for public health and environment are highest. High-risk areas are characterised by a high settlement density and low presence of facilities and services for the sanitary disposal of human excreta and other types of wastewater. Coincidentally these areas also tend to be the ones where privacy is low and demand for environmental sanitation high. The main reasons for preparedness to invest in facilities for human excreta disposal are a greater convenience, privacy and safety for women and status (Blackett, 1994; Chakravorty, 1993; Dian Desa, ca. 1990; Dalmazzo, 1990; IMRB, 1994; Kurup et al., 1996; Mbere, 1983; Murphy and Perez, 1994; Mukherjee, 1990; Rajeswary, 1992; Sundararaman, 1986; Wellin, 1982). Health reasons, which authorities and educators usually stress to promote sanitation, have a much lower validity for the population.

Demands are not necessarily the same for all households. In Kumasi, Ghana, households which had a water supply connection or a higher income were ready to spend more on sanitation than households without them. The highest demand existed among households who owned the house, belonged to the higher income groups, were already spending money on the current sanitation system, and were dissatisfied with it. Gender and other socio-cultural factors such as religion and education allegedly had no influence (Whittington et al., 1992). In Maharashtra, India, wealthier women had a higher demand for latrines than poorer women. Wealthier women live in the village centre and have to walk far to the open land that serves as defecation area. This land is getting scarcer and

distances become longer. Nearby places become very filthy. Other mentioned problems are risk of snake bites and flooding of defecation areas during the monsoon. Poor women combine defecation visits with firewood collection. For them, water collection is a greater problem (Sundararaman, 1986).

As mentioned above, men are less inconvenienced and so tend to have a lower interest and willingness to install and use sanitary facilities for themselves. Male mobilizing factors are, rather, their responsibility, as husbands and fathers, to provide safety and privacy for their wives and daughters, economic considerations (increased value of the house) and increased status. Table 4 lists the gender factors underlying latrine demand in the sanitation programme in Kerala.

Table 4. Gender factors underlying latrine demand in Kerala

Reasons for men to construct latrines	***Reasons for women to construct latrines***
A latrine was a felt need for me, but I thought I could not afford one.	Men can go 'out' at any time. We have to wait for darkness for passing urine and defecation and have to control our diet for this.
I was unaware about the possibilities of low-cost latrines. Local masons and others always mentioned septic tank latrines which are not affordable	We have to go to the beach or canal sides for 'outside area defecation', but when one is seriously ill this becomes a real problem
I had always wanted a latrine for my family. But suitable technology was not known or not readily available	My grown-up daughter going to college started demanding a latrine.
Till recently there was enough open land near my house. Now new houses have come up and going to the 'open air' has become difficult.	Many a time diarrhoea and dysentery have affected our area. The water committee members continue to insist on the need for cleanliness and use of latrines. SEU campaign on 'Fly Control' in our area also mentioned the need for sanitary latrines.
I am more concerned about the security of my wife and daughter. They face a lot of difficulties in finding a safe place for urinating and defecating during the daytime.	We went to our future daughter-in-law's house and saw a good latrine there. They indirectly asked about the facilities in our house.
While using latrines the diarrhoeal diseases can be controlled and money for medical consultations and medicines can be saved.	Our friends in the neighbourhood have proper latrines. We are forced to go outside for defecation. This is really frustrating.
Having a good latrine increases the value of the property.	As women we are directly/indirectly prone to be teased when we go outside for defecation.

Source: Kurup et al., 1996

In Bangladesh, privacy and convenience are used to raise demand under the new social mobilization for sanitation project (Wan, 1992). The sanitation campaign in Botswana pointed out that latrines benefit the health of cattle, an argument which was more convincing for male householders than benefits for human health (Larbi, 1990). Staff in the sanitation programme in Dosso, Niger, created demand by identifying factors in latrine adoption and used these in promoting latrine demand among non-adopters. In the above cases, socio-economic and cultural factors were the most influential in the short term, while health benefits were seen as a long-term effect.

5.3 Implementing programmes the gender way

How do programmes assess and create demand, help communities plan, manage and monitor implementation and help households install, maintain and finance facilities in a gender-sensitive manner? The following paragraphs summarise current approaches and experiences.

5.3.1 Assessment, information and mobilization

The new demand-responsive approaches to sanitation imply that programmes assess the demand of the various user groups and the factors affecting that demand. This has been done through conventional surveys, willingness to pay research, community self-surveys, participatory rapid appraisals (PRA), visits and model review, and inviting requests for services from communities and households.

Surveys and willingness to pay studies, which pay attention to gender, recognize that male and females experiences, responsibilities, views and motivation tend to differ. Interviews of women by men are not always possible, and in some cultures women cannot speak in the presence of their husbands. The age of respondents plays a role in cultures where daughters-in-law are in charge of sanitation tasks, but the mother is law is in charge of decisions.

Interview teams in Yemen consisted of local people, men to interview men and women to interview women. Unfortunately in the analysis of the responses, no distinction is made in the sex and status of the respondents (Crawford, 1990). A survey in Coimbatore, India, revealed that both men and women were willing to pay for sanitation. However, the municipal policy and strategy does not reflect the users' demands (Bergh and Nordberg, 1996). Whittington et al. (1992) used a bidding game to assess demand for various types of sanitation technology, in which they took into account the sex, age, marital status, income, religion and housing characteristics (owner or renter, high rise or single-story housing) of the participants. Income, housing and religion had a clear impact; sex, education and age made little or no difference in this particular case. In New Delhi, the project held interviews on water and sanitation with the male heads of households and the younger women, but only after an introduction with the mother-in-law (Clinard, 1966). Ginanotten et al. (1994) used stratified sampling and participation methods to assess the demands of old and young, male and female, high and low-income rural households.

Guijt (1993) and Bhai (1994) are among those criticising formal surveys and extensive questionnaires. Such research methods place the issues in the perspective of the researchers and risk failing to bring out aspects which are important for the respondents, but which fall outside the frame of reference of researchers with a different status and an often urban bias. Participatory techniques such as PRA help in understanding conditions, demand and possibilities from a local perspective. A condition is that the PRA activities take into account discriminating factors of class, sex and ethnic or religious denomination. For gender aspects, divisions in work, decision making, position and needs of women and men are introduced (Bhai, 1994; Guijt, 1994; Netherlands Ministry of Foreign Affairs, 1995; Wakeman, 1995).

Gender-sensitive participatory tools have proved effective in bringing out sanitation demands. When in Haryana, India, this demand was low, the adult educator introduced nine pictures with drawings of women's daily work. The women ordered the cards in their proper order of sequence and then used matchsticks to indicate the amount of time they spent on each task. When they realized how much time they spent on sanitation and water supply, they were interested to undertake actions to reduce this workload (Pfohl, in Wakeman, 1995). Francis (in Francis and Wijk, 1997) used gender-specific mapping to assess and mobilize latrine demands among rural women and men in a project in Burkina Faso. She used a series of images that depicted socio-cultural demand factors for improved excreta disposal facilities in the region. In separate groups, men and women were invited to select relevant images and put them in the order of their priority. Thereafter, the men presented their findings to the women, and the women to the men. Models of various combinations of toilet, shower and laundry facilities helped inventorize demand and offer various options for low-income urban households in Cali, Colombia. The project also invited male heads of households to experiment with the models and discuss designs and costing, since among couples men (co)decide on the investments (Figure 17).

Widening the information base of users has raised their interest for new options. In an Eskimo community in Canada, one women's representative took part in an orientation visit by the all-male council to a water and sanitation project in a neighbouring area. Her report to the other women, with photographs on the various technologies, led to the addition of a composting latrine to the pit latrines which the men had selected for trial. (PRG, 1980). Rural women in Mexico (McGarry and Elmendorf, 1982) and Honduras (Elmendorf and Kruiderink, 1983) also expressed interest in composting latrines after the concept had been explained to them.

Sanitation programmes have also become demand based by inviting communities and households to submit applications for programmes together with a financial deposit to demonstrate true demand (Alferink, 1995; Kurup et al., 1996; Blackett, 1994;). First questions then are whether also women know about the possibility of application and whether the terms of application do not exclude certain groups.

Information

How to make sure that project information reaches women and men? Project information leaflets used in Maharashtra, India had not reached women. Separate meetings with rich and poor women, and actions to motivate their attendance, were needed to inform the women about the project (Sundararaman, 1986). Similar findings come from Cairo, Egypt (Attia, 1996). In Ecuador, radio was used to reach women at home and demonstration sessions in town to reach men (Spector et al., 1971). Due to low literacy levels, information disseminated through advertisements was inaccessible to many householders in low-income neighbourhoods of Panama city. Home visits from agency staff were also not feasible, as householders worked away from home during the day.

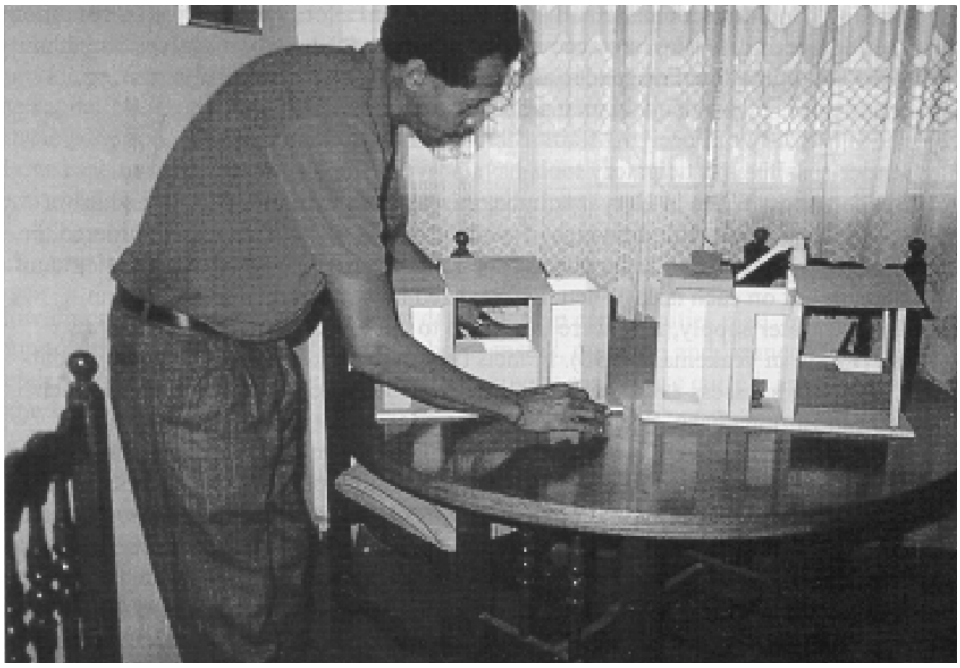

Figure 17. Gender-specific demand inventory for latrines through flexible small-scale models in El Hormigiero, Cali, Colombia. (photo: C. van Wijk, IRC)

An approach through local organizations meant a male bias: co-operatives, clubs and other organizations were male-dominated (Girling, 1983). In other programmes, this dilemma has been solved by involving local women and women's organizations to reach fellow women at home (IRC, 1988; Rukh, 1984; Soepardjo, 1987; Schaik et al., 1995), or at their places of work (Visscher, 1982). Home visits and home meetings have been found essential to reach younger women in seclusion (Abdel, 1983; Schuurmans, 1994).

Terms of application

In applying for sanitation there are other constraints for low-income groups and women, in addition to lack of information and funds. Girling (1983) mentions the inconvenient opening hours of the registration office, elaborate forms requiring a high literacy level, the absence of official documents to prove income level, and requirements for self-help labour. In Panama, these constraints were revealed when sex and marital status ratios on the forms

of applicants were analysed. The underlying causes of the under-representation of certain groups could then be investigated, and remedial action was taken (Buvinic, 1983). Assistance with form-filling as part of the application procedure, and reaching single women heading households through women's groups, made latrines more accessible to the poor (CHF, 1993).

Mobilizing demand

In mobilizing demand for sanitation, women-to-women contacts play an important role. Latrine demands in Maharashtra, India, rose steeply when the programme first approached women according to their class and socio-economic status, and then brought in the men (Sundararaman, 1986). The Baldia slum in Karachi, Pakistan, is a conglomerate of low-income neighbourhoods each with its own ethnic identity. A social worker from the university made house-to-house visits to inform the women about a new type of soak-pit household latrine and to help arrange for construction. Once initial mistrust had been overcome, the local women went from door-to-door to canvass for latrines, allowed their daughters to be employed in social surveys and organized street cleaning. The result was an 80 percent latrine coverage (Rukh, 1984).

Similar accounts of effective demand mobilization through female contacts come from Hoque et al. (1994) in Bangladesh, Schmink (1984) in Mexico, Evans and Appleton (1993) in Indonesia, Khan in Pakistan (in IRC, 1988) and Schaik et al. (1995) in Vietnam. Without the efforts of these voluntary mobilizers, many women and families might still be without improved sanitation. Yet there are strong reasons to look beyond the typical gender divisions whereby women do voluntary mobilization and education and men do the management and the better-paid construction jobs. These are among the topics presented in the subsequent sections.

5.3.2 Appropriate designs and construction

Being responsive to user demands also means taking into account the different design requirements of men, women, boys and girls. Cultural constraints to the sharing of household latrines by men and women or fathers and daughters have been widely reported (Agarwal, 1982; Almedom and Chatterjee, 1995; Elmendorf, 1980; Green, 1982; Kinde, 1981; Langedijk, 1984; Munyibili, 1981; Shafiuddin and Bachman, 1983). The status symbol of the latrine design plays a role for women and men. In Latin America, proud owners left the doors of toilets open to show shiny white toilet bowls to the passers-by. A waterjar nearby which could be filled with a hose reduced the water collection work for the women (Pineo, 1984). Lack of odour and friendliness for use by children were decisive in Bolivia (Murphy and Perez, 1994).

For women, and in some cultures also for men, sufficient privacy of location and design is an important factor. Privacy is reduced when the design leaves the user visible to others, for example, when latrine doors are open at the bottom for ventilation (Rodriguez et al., 1980; Mbere, 1983). Having to carry water and being seen to be doing so, is a cultural and

a practical constraint (Annis and Cox, 1982; Bhai, 1994; Mbere, 1983). Privacy in the location of facilities is another consideration (Korput and Langendijk, 1993). In an East African country, the public health inspector ordered every household in his area to build a latrine, or pay a heavy fine. For ease of inspection, all latrines had to be built along the road. As a result, total coverage was achieved but latrines were not used because people disliked being seen entering or leaving by passers-by (Barrow, 1981). Especially in cultures prescribing seclusion of women, it is impossible for them to use facilities located in public places. This applies also to communal latrines (Racelis, 1979) and manure pits (Dube, 1956). School latrines are not always designed to have separate facilities for girls and boys (IRC, 1993; Nibakure and Wijk, 1995).

Gender differences in design and location are not always heeded. In a project in Pakistan the men wanted the latrines located at some distance from the house, or in the guest room. The women wanted a latrine attached to the house and definitely not in the guest room, as they then could not use it. However, their demands were generally not heeded during the site selection (Korput and Langendijk, 1993). Also in disaster programmes, access for women and attention to sanitation demands were found missing (Hoque and Sack, 1993).

A report of experience with ventilated improved pit (VIP) latrines in Bangladesh illustrates how various technical, socio-cultural and functional demands of new facilities can come into conflict. The case shows that users, both men and women, need to be sufficiently informed about the technology and consulted on the design of the outhouse to combine demands for low construction cost with demands for a design appropriate for use by men, women, and children.

> ‘The vent pipe of VIP latrines should be in the open air so that odour from the pit can be drawn off. Yet they are sometimes completely surrounded by a solid outhouse. This means that the pipe does not function as designed and children are afraid to use the dark, smelly place. On the other hand, women appreciates the privacy offered by these latrines. Outhouses built of open material, such as jute sticks, with an ill-fitting curtain for a door, are liked less by women but are more easily afforded by the poor, and more readily accessible and less frightening for children’ (Gibbs, 1984).

Mothers have rejected latrines for their children, not only because of a lack of understanding of the harmfulness of children's excreta, but also because of the risk of collapse, the presence of snakes, or great distance from the house, while children often fear falling in or the darkness of the hole (Adeniyi, 1973; Fernando, 1982; Jaeger and Mattson, 1989; Langedijk, 1984; Letlhaku, 1964; Mbere, 1983). Some designs are too wide for young children to squat over (Chauhan and Gopalakrishnan, 1983; Shafiuddin and Bachman, 1983).

Ease of operation and upkeep of facilities is important. Increased work in collecting water for flushing and cleaning has reduced demands for a pour-flush latrine unless water is readily available close by (Bhai, 1994; CARE, 1994; Shafiuddin and Bachman, 1983). Latrines have become sources of infection, and are not used regularly when it becomes difficult to keep them clean because of the construction material used, such as very rough concrete (Blackmore et al., 1978), an inappropriate design (Mbere, 1981), or because of overuse and lack of maintenance (Foster and Crossley, 1981). Since women and children usually clean latrines (Gosling, 1975; Green, 1982; Langedijk, 1984), they are most affected by these deficiencies.

Appropriateness of design, including gender aspects, has great importance in schools. A study on school sanitation in seven Latin American countries showed a wide variation in design guidelines and norms for toilet provisions. In reality, there could be one latrine for between 13 and 180 students. Often students could only use the latrines during breaks (IRC, 1993a).

Programmes have adjusted the designs of sanitation facilities by consulting men and women on those aspects that fall within their areas of responsibility and expertise (CARE, 1994; Fernando, 1991). Solid waste disposal in the town of Rada in Yemen is the task of women and children, rather than men. Only 8 percent of the men ever contributed. Evaluation with the women, in separate interviews, revealed that the containers were too high for children and also for short women (Crawford, 1990). In Baldia, in Pakistan design adjustments to latrines were achieved through the presence of a combined male and female team comprising a community organizer, a sanitary engineer and a social worker. Together they monitored the construction and performance of double pit latrines and consulted male and female users on soakpit design modification. Thanks to repeated modification, the unit costs were reduced from USD 200 to USD 80 (Bakhteari and Wegelin, 1992). The review of small-scale models and photographs has also suggested design improvements (Kwaule, 1994; PRG, 1980). Women have been involved in the aesthetic and cultural acceptance of new facilities. For example, they influenced the design and colour of household latrines in communities in Mexico and Colombia (Elmendorf, 1980), and in Botswana (Mbere, 1981), and the design of communal toilet facilities in a low-income urban neighbourhood in Nepal, where the original closed cabins were not in accordance with traditional communication habits (Saubolle, 1980). In El Hormigiero in Colombia, male and female heads of households together chose the most appropriate designs for their sanitary units as part of a community-managed sewerage project. The factors looked at include convenience, cost, status, the possibility of reuse of existing components, and ventilation. Small-scale components, with which the householders can build and cost their preferred model(s), facilitate the decision making (IRC/UNDP-WB, 1994).

Although detailed gender information is lacking, it is plausible that women, in particular, have contributed to the appropriate design and siting of children's latrines developed in Sri Lanka (Fernando, 1982), Uganda (Letlhaku, 1964) and India (Clinard, 1966; Oswal,

undated). In other places, they have decided to retain traditional latrines for young children because the new types were unsuitable (Elmendorf, 1980; Wijk, 1982).

Gender divisions and impacts in installation

Cultural norms on the division of work and responsibility have an impact on what construction work is best done by women and what by men. In Mexico, the men did all construction work (Miller and Cone, 1984). But in West and East Africa, latrine construction and kitchen improvements require the involvement of both women and men. Some tasks, such as digging, and roofing, which is important to prevent collapse and non-use in areas with a long rainy season, are men's tasks. Other tasks, such as plastering, are done by women. The women themselves pointed this out in a focus discussion when they commented on a picture which showed only a woman involved in the construction of a latrine (Wijk, 1985: 94).

This does not mean that women have no technical tasks in the supervision of construction quality and the construction of the household facilities themselves. Where women are at home during the day and are given the required technical information, they are highly motivated to see that construction is correct and facilities durable and properly finished. In Baldia, in Karachi, Pakistan, almost half the work of constructing soakpits was overseen by women (Bakhteari and Wegelin, 1992). The same is reported in sanitation projects in Sri Lanka and other parts of Pakistan (Hoque et al., 1994; UNICEF, 1983). In a project in Indonesia, the local branch of the national women's organization keeps women informed about material prices so that contractors cannot overcharge them when building latrines. They also see that a project technician comes to check the technical quality before payment (Soepardjo, 1987). Women in Bangladesh share in or fully undertake the construction of household latrines (Clarke, 1983; Rukh, 1984; Hoque, 1991; UNICEF, 1993).

Health has been an entry point for women to enter technical training for sanitation. When the Viasayas project in the Philippines began to train 'Household Unit Representatives' in hygiene and sanitation, 70 percent of the participants were women and 30 percent men. Their socially approved role as primary health care givers enabled these women to pass the demarcation line between what is seen as women's and men's work (Ybañez, undated). Using similar reasoning, UNICEF is developing a latrine building programme through trained female youth groups in Sri Lanka (UNICEF, 1993).

Paid craftswomen in the private sector

The abundance of cases where female masons take their place among men gives ground to the hypothesis that this shift is not accidental. Especially in the growing role of the small-scale private sector, the dynamics in gender developments become visible. Private latrine builders are by now a common sight in Lesotho. They, their customers and the unit which by 1989 had trained 900 builders in demand raising, construction and administrative skills, had together achieved the construction of 12,000 VIP latrines (Blackett, 1994; Evans, 1987; Evans and Pollard, 1988). One in four of the builders is a woman. Masons qualify

and get a certificate when they have built six latrines according to the specifications (Kinley, 1991a). Many of them have also taken training as village health workers. Features which distinguish female from male builders are their greater efforts to raise demands, lower preoccupation with profit, and preference for working in partnership (UNDP-World Bank, 1990).

Many poor women in India and Sri Lanka have seasonal jobs as unskilled labourers in the building industry. Programmes in peri-urban and urban areas in these two countries have trained these women in environmental sanitation and slum improvement. In Kampur, a town in North India, thirty women have become skilled latrine masons. Because they could not find jobs as individuals, they joined in a cooperative. This increased their bargaining power with the municipality, and all now have building contracts (Haskoning, 1988).

Women masons in Kerala, India, also formed a builders' cooperative. Together they produce building blocks for latrines and get contracts from the local authorities for building domestic latrines as part of the local authorities' sanitation programmes. Private households also give them contracts to build latrines. In 1994, the cooperative made over 25,000 building blocks and built over 1,000 latrines. During their training, much attention is given to confidence and group building, as well as technical skills. The women report higher and more reliable incomes, better working conditions, greater self-confidence and new skills, and more respect from their customers, relatives and the community at large. In particular, the work offers new chances for widows and abandoned women who have a very difficult position in the Indian culture (Kurup et al., 1996 and Figure 18).

Employment experiences in Zimbabwe resemble those in India. In one district, 116 women were trained as latrine builders. About half now work as such, often in groups. Obstacles ranged from lack of appropriate clothing to lack of motivation in tackling male-dominated roles. As in Lesotho, female masons also charge less, in order to get work (Olsson et al., 1990)

*Figure 18. Block making by women masons (*photo: SEUF, Kerala, India)

Kirillapone is a squatter area in Colombo in Sri Lanka. Save the Children started a housing improvement project in the area. Women were offered training alongside men because they sought employment in their home area. No women reacted to a public announcement of the training opportunity. When a special registration for women was organized, 58 women applied for training. Many other women were engaged as unskilled labour and learned new skills on the job. Soon women formed the majority on the workforce and some of them became team leaders. The work provided an income and improved their social position. It also brought greater solidarity in a squatter area where women so far had not acted as a group, because they belonged to different socio-economic sections (Muller, 1991).

In Mozambique and Tonga, latrine slabs are made and sold by women's cooperatives (Cairncross, personal communication; IWTC, 1982). In Botswana, Thailand and Rajasthan in India, projects have also trained local men and women to construct latrines (Basaako et al., 1983; Karlin, 1984; Wakeman et al., 1996). Between 1991 and 1993, 270 poor women in Bhutan were trained as smokeless stove builders; 69 percent of them also got trained as latrine mason (EU et al., 1995). In Tonga, female builders in environmental sanitation also work in the public sector. Women community workers in Tonga have been trained since 1984 in the construction of rainwater storage tanks and VIP latrines. To deal with high groundwater tables, the latrines are of a raised type. Training includes practical construction and maintenance skills; aspects of health and hygiene; and financing; including costing and budget planning, record keeping, and bookkeeping. The training lasts six weeks and involves actual construction (Fleming, 1986, 1987).

Case studies from India, Sri Lanka, Jamaica and Nicaragua show that, once trained and skilled, women are well-accepted in such occupations (Stenvang et al., 1990). Acceptance is less easy for women in a senior position, or where programme authorities are not supportive (Borba, 1997; EU et al., 1995).

Equity of payment for female sanitation workers differs from case to case. In the case of Kirillapone, in Colombo, Sri Lanka, the women received the same wages as the men. In the Mirzapur project in Bangladesh, desludging of latrines had not been foreseen in the project budget. Hence local women were hired at 20 percent of the cost of scavengers to empty the pits (Hoque, 1991). Equal payment is also absent in Zimbabwe (Olsson et al., 1990). In Nepal, women are trained in simple latrine construction, but they only get five days' training and thereafter work as volunteers (Morgan, 1992).

Training in masonry work builds on women's traditional tasks and skills in plastering. This, and the fact that the construction of domestic sanitation facilities takes place within the private premises, may well explain why female masons are socio-culturally acceptable. So far as is known specific research into the gender and other factors underlying these developments and impacts has not been carried out.

Loss of resources

The only aspect that has been researched has been the impact of improved sanitation on employment and resources of the poor. Known as night-soil collectors, scavengers or, euphemistically, sweepers, the emptiers of bucket latrines work in the public as well as the informal private sector. The number of night-soil collectors employed in some parts of India by municipalities alone is estimated to be between 500,000 and 650,000. Although no specific figures could be found on the number of women employed, they are well-represented (Wijk, 1985: 24). Women also work as private sweepers in wealthy households because the high castes prefer their womenfolk not to come into contact with male sweepers (Chatterjee, 1981). This work is done either in addition to a job with the municipality, or under the ancient patron-client relationship in which the women are paid mostly in food and cast-off clothing (Mishra, 1981; Trivedi, 1977). Sometimes, as in the cities of Varanasi in India and Karachi in Pakistan, women have obtained secure and relatively well-paid jobs and work as respected and equal partners with their husbands (Chatterjee, 1981; Clarke, 1983).

Employment in the informal private sector makes these women more vulnerable to sanitation improvements. Municipal sweepers have a formal job and their position is visible. Programmes which replace the bucket system by sewerage or double-vault pour-flush latrines, have offered the men training for marketable skills. Whether this was also offered to women is not reported (TAG, 1984). Those women who have private arrangements either lose their jobs, or are only called in to remove drain blockage by hand when drains get blocked from lack of water for flushing (Mitra, 1992).

Labour-intensive excreta and refuse collection systems are very common in fast-growing cities. Cases are also reported in cities in Afghanistan (Etherton, 1980), Egypt (Haynes and El Hakim, 1979; Maan, 1995), Colombia (Etherton, 1980) and Mexico (Schmink, 1984). Exploitation occurs and is increased by middlemen who sell cleaning rights to individual households. Nevertheless, these systems, in which women and children often play an important economic role, provide a living for many poor households who have no alternative. Improving these systems, rather than replacing them has proved a better solution for the municipalities and for the families involved (Arrais, 1994; Furedy, 1991; Maan, 1995).

5.3.3 Financing and cost sharing

Women may be more motivated for improved sanitation, and in some areas may manage the family budget, but decisions on domestic investments are usually taken by or with the husband. A gender approach was therefore found to be needed in decisions on the installation of domestic sanitation improvements (Grady et al., 1991; Kishwar and Barq, 1990; Meyer, 1993; Tunyavanich et al., 1987; Wijk, 1994).

Women who have their own possibilities of earning have spent part of their income on improving domestic facilities (Evans and Appleton, 1993). Women from Chiuchin in Peru,

who were eager to improve sanitation, subsequently pooled their resources and in one season earned enough money to pay for the plumbing for a public toilet (Bourque and Warren, 1981). Financial autonomy and decision making are treasured attainments. Yet there is the equity point that, for married women, the net value of these earning is often far less than the income earned by their husbands, and the full financial burden should therefore not rest on the women alone.

Although offering a greater range of options makes some degree of improvement affordable to a larger group of people, not everyone can afford the required investment (Watson, 1993; Meyer, 1993). Moreover, there may be hidden costs, such as travel to offices and long waiting times, complex forms, too large down-payments. Collecting local materials and doing part of the construction work as self-help labour is a way to cut costs. Women who have a high demand and little access to cash for facilities also do the construction themselves. This has been found in secluded cultures as well, provided the work can be carried out in private surroundings (Clarke, 1983; Hoque, 1991; Rukh, 1984).

Households headed by old people or women cannot always do construction, or may lack the required building skills; a reason why latrine ownership among them is lower (Green, 1982; Kirimbai and Wijk, 1983; Kreysler, 1970; Nordberg and Winblad, 1990). Where transport is required to collect timber and sand, poor households are also excluded. Lack of financial and labour resources is not always the only problem; in poor neighbourhoods with very dense settlements, the resource lacking is often space.

Credit, labour assistance and communal latrines

There are several ways in which programmes have overcome these constraints. Providing access to credit was effective in Bolivian peri-urban areas in enabling poorer households to hook up to the sewerage system and to build household bathrooms (Murphy and Perez, 1994). Households in Kumasi, Ghana can take a two-year loan which is managed through the local sanitation committee (Kinley, 1992). In the city of Surakarta, Indonesia, the programme has established a revolving fund for sanitation. Households take loans at a monthly interest of 1.36 percent, which they use to build the latrine using a private contractor. The programme supervises the technical quality (Soepardjo, 1987). The youth clubs in Midnapore, India helped to get loans from the programme's cluster unit to poor rural households. The clubs are responsible for the repayment of the loans by the households (Chakraborty, 1993). In Bangladesh, the Grameen Bank provides loans for households who want to buy their latrines from the emerging commercial sanitation marts (Nigam and Ghosh, 1995). Almost 90 percent of those taking a loan are women (Stenvang et al., 1990). Some sanitation marts also give credit in a limited way (Ikin, 1994).

In Togo men's and women's development societies reserve part of their profits for development projects such as sanitation. The women's societies must deposit one third of their income from economic projects into the development fund. How much the male societies contribute is not reported (Boucher, 1987).

Households in thirteen towns in Lesotho already have experience with credit schemes. To allow them to take a loan for a latrine, the sanitation programme negotiated a loan scheme with the para-statal Lesotho Bank. The sanitation unit, which is a government agency, gives advice and assistance, but purposely does not make loans itself. In the past, government loan schemes have had a bad repayment record, attributed in part to the borrowers' awareness of government's inefficiency in collecting debts and prosecuting defaulters. The Bank has since expanded its loan service to low-cost housing schemes and the extension of the urban infrastructure. Repayments are made in 20 periods over 2 years. No repayment is demanded in December and January because of the cost of the season and the payments of the new year's school fees (Blackett, 1994).

In credit schemes, gender issues have had to be addressed. Forty percent of single women and 32 percent of others who applied for a loan in a programme in Panama did not qualify because their incomes were too low. Only 15 percent could pay the initial down payment. When income from relatives could be included, and all assets were counted at full value, the proportion who could make the down payment rose to almost 70 percent. A lower down payment and a lower standard design increased access further, but still 30 percent of single household heads and 20 percent of couples could not pay (Buvinic, 1983). Hence, CHF (1993) provides loans through women's organizations and combines them with economic projects. Information is spread through comic books, the primary reading material in the target group families. In Cochabamba, Bolivia, CERES uses flexible loan repayment rules. While 80 percent must repay the loan in one year, 20 percent get more time (McLeod and Mitlin, 1993). Absence of the common practical gender constraints (information only to men, high collaterals and transaction costs, large loans, short repayment time) in San Salvador led to 80 percent participation by women (Buvinic and Nievos, 1982).

The local branch of the Indonesian national women's movement in Surakarta is given training on the project and then contacts women to stimulate their families to join the credit scheme. It also supervises implementation, e.g. by preventing contractors from over-charging for materials, and motivates loan repayments and latrine maintenance through its 'ten family groups' system (Soepardjo, 1987).

In Lesotho, married women have the status of minors. They are not allowed to sign legal documents, unless with permission of their husbands. Hence a woman could only sign a loan agreement for a latrine if she was single or had a letter of agreement from her husband. The latter posed quite a problem, and often led to long delays, as some husbands were working in South Africa as miners. The programme therefore had to specifically target its promotion to men (Blackett, 1993).

No credit facilities for sanitation exist yet in Vietnam, but Schaik et al. (1995) have pointed out that in Vietnam the role of the Women's Union need not be limited to voluntary mobilization and the education of other women. The Union's expertise includes management of funds and construction. Through its experience with various forms of credit

schemes, it is also in a position to reach the poorer women whose families have not yet benefited from the project. Some of the credit and savings systems of the Union are particularly suitable for poorer families, as they have flexible repayment arrangements. The Union is now being involved in sanitation and hygiene programmes.

Dian Desa, a water and sanitation NGO in Indonesia, also stresses flexibility. Twenty villages in Java accepted self-financing after an open discussion. All villages already had experience with loan and saving funds, especially in agricultural cooperatives and women's organizations. However, it was necessary to make adaptations in the size and duration of loans, repayment schedules and types of collateral, and to add dynamic learning programmes (Dian Desa, ca. 1990). To finance sanitation and other developments, villages in Togo have created local development funds. The funds come from economic projects, such as collective farming, of which women run half. Each economic project has to deposit one third of its profit into the village treasury and one third in the development fund. The remainder can be reinvested (Boucher, 1987; Graham, 1990).

Targeted subsidies was the strategy chosen to help poor households finance latrines in Karachi, Pakistan and Kerala, India. Other households pay all investment costs themselves. In Kerala the subsidy comes partly from the local council and partly from voluntary groups. In both cases, the local committee selects the qualifying households. The Kerala committees display the list of chosen beneficiaries publicly for greater accountability (Bakhteari and Wegelin, 1992; Kurup et al., 1996).

To overcome the labour and transport constraints of poor and single-headed households, programmes have made special arrangements. In the urban slum latrine improvement project in Karachi, Pakistan, the youth group installing the latrines gave free labour to widows and destitute families (Bakhteari and Wegelin, 1992). Training women for self-construction has also been undertaken. In a housing project in Panama, women were trained to carry out their own masonry, carpentry and plumbing work (Girling, 1983).

Where lack of space is the problem, communal facilities with toilets, showers and laundry basins have been installed. Sometimes the households build them themselves, as in Indonesia. Even households who did not need the facility contributed out of solidarity (Soepardjo, 1987). The managers of such facilities are either a user association, with member households paying regular fees for maintenance and use, or the service is run by a local NGO and users pay every time they use the facility. The fee is essential for keeping the facility clean and sustaining its service (Kurup et al., 1996; Soepardjo 1987; Saubolle, 1980; Vijayendra, 1981).

Where sanitation blocks are run as a commercial enterprise, little is known about the balance in use between women and men. The indications are that in facilities for mixed use, most users are income-earning males who work in the informal private sector (Vijayendra, 1981). Some agencies therefore specialize in facilities exclusively for women

(Kurup et al., 1996; Bhai, 1994; Saubolle, 1980). More research on the effectiveness and cost-benefit of these facilities is required.

5.3.4 Management, monitoring, maintenance, use

So far, sanitation programmes have focused more on creating facilities than on creating capacities in communities to run their own programmes and services. Where communities themselves run programmes, a community organization formed for this purpose is usually in charge. Sometimes the local council is also involved (Kurup et al., 1996; Bakhteari and Wegelin, 1992; Khan, 1992; Soepardjo, 1987). They investigate demand, allocate support, organize and supervise construction and manage and monitor physical and financial progress and programme results. They may also manage the service (Schmink, 1984; Soepardjo, 1987). The gender aspects of taking part in management organizations, training and decisions are similar to those of management of local water supplies.

Monitoring the operation and maintenance of newly-installed sanitation facilities is very relevant. Poorly operated and maintained facilities are a health and environmental hazard rather than a benefit. Extent of use is also important. When only a small minority has and uses good sanitation, no impact on public health is possible. There is some proof that the critical frontier is 75 percent (Esrey, 1994). A threshold theory, tested in Bangladesh and Lesotho, states that there is a certain minimum level of investment in water supply and sanitation below which very little detectable health improvement will follow. In the same way, there is also a cut-off point above which additional investments will make little more difference (Shuval et al., 1981 in Nordberg and Winblad, 1990). Hence the motto at the closure of the IDWSSD: ‘Some for All rather than All for Some’. Unfortunately, sanitation programmes still follow a scattered coverage approach and do not concentrate on threshold coverage in high risk, high demand areas (Murphy and Perez, 1994).

Who monitors coverage, operation, maintenance and use? In the move towards community-managed sanitation, monitoring is increasingly part of local environmental management. In the Dosso sanitation programme in Niger, the village map serves as a monitoring and management tool. Follow-up visits on maintenance and use are being planned. (Nibakure and Wijk, 1995). The sanitation and hygiene programme in Uttar Pradesh, India, uses pictorial monitoring forms to monitor latrine installation and use, among other things. Female motivators engaged temporarily by the programme to mobilize latrine demand also pay the monitoring visits after installation and fill in the pictorial monitoring forms (Netherlands Ministry of Foreign Affairs, 1995).

Monitoring in Kerala, India, is part of the work of the voluntary ward water committees. Each committee consists of several women and men. The members visit the new latrine owners at home and jointly score the latrine on observable indicators of cleanliness and use (Figure 19). Care is taken that indicators are objective, such as ‘no excreta or excreta smears in pans’ rather than ‘clean pan’ which different people may interpret differently, for example, considering discoloured water due to a high iron content as dirty. In areas where

use and cleaning are inadequate, the committee may organize a session to discuss health (Kurup et al., 1996). The work of visiting is voluntary and adds especially to the load of the women, as they have less free time then the men. The programme is aware of this and has looked into measures to reduce the strain. Basically, and similar to experiences in Honduras (Whitaker, undated), the women who do the monitoring see this as an important community service and find time for it by organising their housework in a different way (Abdulla, personal communication).

Proper operation and maintenance of latrines and other sanitation facilities is not only related to a sense of ownership and hygiene values, but also to ease of use and cleaning and to understanding the technical characteristics of the facility. Latrines have become sources of infection and have not been used regularly because the rough surface of the slab made it hard to keep clean (Blackmore et al., 1978; Feliciano and Flavier, 1967), the design made cleaning difficult (Jaeger and Mattson, 1989; Mbere, 1981) or the number of users was too large (Foster and Crossley, 1981). Since much of the regular maintenance work is done by mothers and their children (Gosling, 1975; Green, 1982; Langedijk, 1984), it is essential that they can review designs on ease of cleaning and that they understand the technology. This avoids that, for example, water seals are broken and junction boxes are not changed as required, because their function is not understood or, in the case of the seals, because there is no water for flushing within easy walking distance (Arrais, 1994; Kurup et al., 1996; Kanungo, 1957; Shafiuddin and Bachman, 1983; Wilson, 1981) .

Who uses latrines within the household? Reports indicate that use is greatest and most consistent among women (Wijk, 1994). Use by men and young children needs to be promoted, as well as the sanitary disposal of babies' faeces (see Chapter 6). For the safe disposal of babies' faeces, the widely prevailing notion among mothers that babies faeces are harmless is a constraint that has to and can be overcome (Curtis et al., 1993). More details about hygiene education, behavioural change and its gender aspects can be found in the next chapter.

Figure 19. Women of a Ward Water and Sanitation Committee monitoring, use, maintenance and operation of the new pour-flush latrines (photo: SEUF, Kerala, India)

6. Working for Better Hygiene - Sharing the Tasks

Health education in water and sanitation programmes or as autonomous programme tends to be directed at women. The practices promoted in these programmes increase the amount of work of women, a burden that is already high. Facilitation of work, the responsibilities of men and the redistribution of labour are often not addressed. This chapter reviews the gender aspects of the practices that affect health. It describes how women and men are involved in hygiene improvements and stresses and gives examples of more gender sensitive programmes.

6.1 Health education and behaviour change

It has been common that agencies one-sidedly develop water and sanitation improvements. When they find that the facilities are not accepted, they call for health education to promote the desired practices (Wijk, 1985: 85).

> 'Health education has often become the scapegoat for all kinds of programme failures. It is easy to blame people for programme failures. Planners and administrators would like to change people's behaviour to fit programme requirements, technology and procedures. Health education can become a tool of compulsion' (Kochar, 1981: 8).

When facilities do not meet the requirements of the users, health education alone cannot change behaviour, and added to the improvement of facilities adjusted to user needs health education is essential to realize health impacts.

6.1.2 Potential health impact

Epidemiological research confirms the value of combining improvements in sanitation, water supply and hygiene for public health. In his review of approximately 200 health impact studies and five summary reviews, McJunkin concluded that,

> 'a significant body of evidence supports the positive linkage between sanitary water supply and excreta disposal and long-term improvements in health status. This linkage is supported by long-term empirical observations in both the developed and less developed countries' (McJunkin, 1983: 94).

A study by Esrey and Habicht in 1986 found that, of 26 studies on sanitation, 33 on water supply and eight on both interventions, 20, 16 and 6 respectively reported a positive impact on health. In 1990, Esrey and others reviewed 144 studies on the impacts of improved water supply, sanitation, hygiene, or any combination of these, on six common diseases. They found a large impact in expected reduction of cases. In the methodologically better

studies the impact on child mortality ranged from 20 to 82 percent, with a median of almost 60 percent (Table 5).

An expert meeting of epidemiologists and other health specialists organized by WHO/SEARO in 1993 supports these conclusions. The meeting gave safe excreta disposal, especially by diseased people and children and more water for personal hygiene, especially handwashing and protecting water quality, in that order, as the most influential factors on reducing morbidity and mortality of diarrhoeal disease.

Table 5. Impacts of improved water supply, sanitation and hygiene on morbidity and mortality for six common diseases: evidence from 144 studies

	Expected reduction in morbidity and mortality from improved water supply and sanitation					
	All studies			*Methodologically better studies*		
	No.	*Median*	*Range*	*No.*	*Median*	*Range*
Diarrhoeal diseases						
• Morbidity	49	22%	0-100%	19	26%	0-68%
• Mortality	3	65%	43-79%	-	-	-
Ascariabasis	11	28%	0-83%	4	29%	15-83%
Guinea worm	7	76%	3-98%	2	78%	75-81%
Hookworm	9	4%	0-100%	-	-	-
Schistosomiasis	4	73%	59-87%	3	77%	59-87%
Trachoma	13	50%	0-91%	7	27%	0-79%
Overall impact on child mortality	9	60%	0-82%	6	58%	20-82%

Source: Esrey, 1990.

Adding hygiene promotion is particularly efficient and effective in reducing morbidity and mortality from child diarrhoea. In their recent study, Murray and Lopez (1996) give a cost of USD 21 per disability-adjusted life year saved (a combination of morbidity and mortality reductions), against costs of USD 24 for oral rehydration therapy and USD 15-35 for expanded immunisation.

6.1.2 Gender aspects of key hygiene behaviour

Gender and safe excreta disposal

As the introduction of improved sanitation is much slower than that of improved water supply, fewer studies could be found on the use, and especially the gender, age and class/group specific use of sanitation facilities than of water supply. Those studies that could be found focus, in particular, on latrines. Some 14 studies reported in Wijk (1985) point at a higher use of latrine facilities by women and older members of the family than by children and men, findings also reported by Jaeger and Mattson in 1989 and IMRB in 1994. The main reasons for continued open-air excreta disposal by men and children

seem their greater mobility and the socio-cultural acceptability of this practice. Since latrines only contribute to health if they are used hygienically by a significant proportion of the users (Esrey, 1994 mentions 75 percent), men and children clearly need to be targeted more in the promotion and evaluation of latrine use.

For the safe disposal of the excreta of small babies, infants and toddlers, their mothers and older brothers and sisters are the main partners. A constraint here is the widespread belief reported in ten different studies that children's excreta are harmless

(Wijk, 1985). Studies by Almedom and Chatterjee (1995), Curtis and others (1996) and Zeitlyn and Islam (1991) show the belief is persistent. The level of education of mothers is as important as the presence and use of a latrine. This is demonstrated by Esrey and Habicht (1988). Where mothers are literate, the presence or absence of a toilet has hardly any impact on infant mortality. The researchers ascribe this to the habits of these mothers to dispose of infant excreta in a hygienic way. In families with an illiterate mother, the presence of a latrine makes a great difference. Infant mortality in these families is half that in similar households without a latrine.

Gender and personal hygiene

The second most important behaviour for better health is better personal hygiene. Particularly important is the washing of hands after defecation and before food preparation and eating, and the manner in which the washing is done. Handwashing after defecation is important for all user groups. Handwashing after latrine use is not universal and often only water is used (IMRB, 1994; Wijk, 1985; Wilson and Chandler, 1993; Zeitlyn and Islam, 1991). Also, the practices reported may be ideal rather than real behaviour. Kirimbai and Wijk, (1983) and Therkildsen and Laubjerg (1982) found, for example, that householders would say that they washed hands with soap but that there was no soap present in these households.

Handwashing with soap has proved effective in preventing faecal-oral transmission of disease in children under five years of age. In a controlled experiment in Bangladesh, the project gave soap and earthenware pitchers for water storage to a group of households with confirmed cases of shigellosis. Health workers educated families on the need for handwashing, and monitored hygiene practices. The spread of infection was significantly lower (by 10.1 percent) in the study households than in the control group (32.4 percent). The greatest difference (over 40 percent reduction) was found in the group of children under five years of age, probably because mothers feed them, thus unconsciously spreading infection if they have not washed their hands beforehand (Uddin, 1982). Handwashing with water only made no difference.

Wilson and Chandler (1993) report similar findings in Indonesia. They supplied 65 mothers of children under the age of 11 with soap and a soapbox, and encouraged them to wash their hands and guide the children in handwashing. The researchers recorded an 89 percent fall in the prevalence of diarrhoea as compared to the period before the

intervention, and a 57 percent difference with a neighbouring community without handwashing promotion. Unfortunately, neither study investigated the alternatives which women use when soap is too expensive or not easily available, such as ash, sand [which should be clean], leaves and dried plants.

Handwashing in relation to food preparation relates in particular to women. Risks reported in food handling include unhygienic kitchen conditions and practices (Badran, 1981; Kjaer, 1980). A study in Thailand showed that water used to soak dishes had high levels of faecal bacteria (Pinfold, 1990b). Handwashing before meals seems to be more common than before food preparation and after latrine use, but often only water is used (Adeniyi, 1973; Green, 1982; Karunadasa, 1984; Kirimbai and Wijk, 1983). Mothers who prepare the household food and care for the children may unknowingly become a link in the faecal-oral chain of disease transmission. A study on tortillas prepared by 56 housewives in a Guatemalan village indicated a high level of faecal contamination from the use of contaminated water and probably also from the hands of the women themselves (Capparelli and Mata, 1975).

Zeitlyn and Islam (1991) show how the effectiveness of handwashing habits can be related to concepts of religion and health. Investigating handwashing habits in urban and rural Hindu and Muslim communities in Bangladesh, they note that soap is little used, because it is expensive and is regarded as a cosmetic rather than an agent to remove micro-organisms. Rubbing hands together, which would be a substitute, is avoided, because the right and left hand should be kept separate. Children are not encouraged to wash their hands at all, because water and soap have a cooling effect, which in the hot-cold classification of health is only pursued in case of fever. Curtis and others (1996) and Buil (1994) also find links between the sanitation and hygiene practices and religious beliefs.

The risk of disease transmission from lack of hygiene is especially great in schools. Often boys and girls cannot or do not use toilets hygienically and cannot wash hands with soap, or a good soap substitute such as ash, clean sand, with firm rubbing using plenty of water, and not all using the same water. The reduction of transmission risks through better hygiene practices involves looking at all points of transmission for all water and sanitation-related diseases. A programme on an island in Micronesia promoted better handwashing habits in schoolchildren. However it also increased the spread of trachoma because handkerchiefs and towels became channels of disease transmission. In another case, the school's well water became contaminated because, in order to wash their hands, the children picked up the bucket and rope immediately after defecation (Marshall, 1972; Saunders and Warford, 1976).

Gender and preservation of water quality

The preservation of good water quality from source to cup is the third most important behavioural factor for disease reduction. Chapter 2 has shown that contamination of the water source is influenced by gender-specific land and water use practices. Contamination can also result from poor operation and maintenance and use of the water supply system.

When piped systems are not under constant pressure, dirty water can seep in. Groundwater is also contaminated through dirty surface water (Attia, 1996). In water transport, and in storing and drawing water in the home, women and children are the main actors whose behaviour can contaminate clean water (Young, 1989). (Re)contamination is also common in cases where water is sold by private vendors (Zaroff and Okun, 1984).

Cross-cultural observations show that the risk of contamination of safe drinking water often persists after the introduction of an improved water supply system. At the source, women sometimes use dirty water for priming the handpump (Germany and UNICEF, 1983). Vessels such as open pots, basins, and buckets, instead of the narrow-necked water jars used in Ethiopia and many other places, increase the likelihood of drinking water being contaminated when women or children touch water with dirty hands during transport. In many cases, alongside with good habits, harmful practices have been observed. Wijk (1985) refers to thirteen studies where drinking water is reported as not always being stored separately or being kept in open storage vessels, while new water is collected and added without regular cleaning of storage vessels. The presence of a communal cup on top of the drinking water pot, which all use to draw drinking water, is also common, as is touching the water with dirty hands in drawing and transport (El Katsha and White, 1989; and ten studies in Wijk, 1985).

E-coli tests of drinking water at the source and in collection and storage vessels have confirmed contamination as a result of such practices (Pinfold, 1990b; Simpson, 1993; nine studies in Wijk, 1985). Helminthic ova have also been found in stored drinking water (Khairy et al., 1982).

Recontamination of drinking water is related to poverty. Households with a private tap in the house do not need to store water unless the water supply is irregular. In that case wealthier households can install a storage reservoir from which water flows automatically or which has a tap to draw water. For simple storage pots, tests have shown that water kept in earthen pots is of a worse quality than water stored in the brass and copper pots owned by wealthier households in South Asia. This was the case even if the water had been touched by hands (Desai et al., 1977). Earthen pots not only have a lower effect on quality, but unlike copper pots, cannot be scoured too often with sand because this closes the pores that help to keep the water cool by evaporation (Chauhan and Gopalakrishnan, 1983). Wealthier households also tend to have more vessels and so more separate storage capacity and longer storage time. Longer storage time reduces the bacteriological count (Elmendorf, 1987).

6.2 Limitations of singling out women and girls

Given the key roles of women in the management of water and waste, it is not surprising that many hygiene programmes, and studies used in preparing such programmes, have women as their only target group (Alam et al., 1989; Aziz, 1995; CINDE and CVC, 1989; Damen, 1993; Groote, 1990; IDRC, 1986; INSTRAW and UNICEF, 1988; Lockery, 1996;

Morgan, 1994; Nordberg and Winblad, 1990; Schuurmans, 1994; Tunyavanich et al., 1987; Wilson and Chandler, 1993; Young, 1989; and ten studies in Wijk, 1985).

Sometimes hygiene promotion is the only aspect of water and sanitation programmes in which women are directly involved. Limiting women's participation to health education increases the chance that necessary changes to the project design through their involvement in the planning phase will not be made. When focusing only on women in education programmes, prevailing gender relationships ensure that women often face serious limitations to their participation in such programmes. A lack of a gender approach also causes that issues such as division of labour and control over hygiene improvements remain unaddressed.

6.2.1 Position in the household

Sex, age and position in the household all influence the possibility of taking part in hygiene education. For wives, the attitude of the husband plays a role. Husbands in both secluded and non-secluded societies have opposed the participation of their wives in women's educational programmes (Albihn et al., 1982; Berger et al., 1975; Boesveld, 1994; Clark and Gakuru, 1977; Groverman, 1983; Hale, 1977; Russell, 1979). There are cases reported where hygiene education programmes on women's issues reached mainly men, for example, in Ghana (Harkness, 1983; Jackson and Palmer, 1983), Bangladesh (Hochet, 1980) and Tanzania (Andersson and Hannan, 1984). In an experiment to link hygiene education to a water project, a project in Tanzania used the existing hierarchical structure. It was found that this reached mainly males, but that the education was not spread either to other males, or to females (Tanzania, 1983). The same occurred in Bolivia (Karp et al., 1990).

In extended families the mother-in-law may have a great influence on the possibilities of her daughters-in-law to participate and practise new behaviour. This has been the case, for example, in India (Clinard, 1966; Sörensen, 1992) and Yemen (Crawford, 1990). In the more conservative Pashtun villages in India, only old and young women are mobile and can attend meetings (WSC, ca. 1994). At the same time older women themselves are less open to hygiene education (Karp et al., 1990). Older sisters and brothers take care of their younger siblings (Morley, 1979; WHO, 1992) as do other female relatives. Sometimes these are involved in hygiene promotion (Alam et al., 1989), but young girls cannot always easily practise new behaviours. In Tanzania, young girls have been frustrated by school health education, because their parents and later their husbands have not accepted what they had learned at school and would not support their attempts to introduce new practices at home (Jellicoe, 1978). As seen below, this gender situation persists today in many cases.

6.2.2 Religion and class

Besides household position, religion and class plays a role. In religions which propagate seclusion for women, wealthier women are generally more restricted in their freedom of

movement than poorer women, as the latter have to work for a living. But mobility also depends on the degree of fundamentalism of the parties in power, the level of education and exposure to other lifestyles. Schuurmans (1994), for example, found that in Quetta, Pakistan, the economically better off Hazaras with a more urban lifestyle observed less strict purdah than the Pashtoos. The latter are much better off socio-economically, but have lived for a shorter time in the city. And in both Indonesia and India it proved easier than had originally been assumed for young Moslem women to play a role in hygiene education with women (Narayan, 1988; Nanavatti, personal communication).

The fact that poorer women have more freedom to move does not always mean that they can more easily take part in education for health and hygiene; often they cannot afford to use their greater mobility for activities other than work. An analysis in northern India showed that the more conventional women's clubs were attended mainly by women from wealthier and higher status families.

> 'They teach many details of nutrition and food preparation, household hygiene, including how to make soap, baby care, sewing classes, and promote the cultivation of kitchen gardens. It is ironic that the women who dominate such meetings are, as a class, the least likely to undertake many such chores by themselves. The lower classes of working women and labourers who must regularly do all such chores themselves, are not reached by the clubs' (Hale, 1977: 413).

Programmes in Ivory Coast and elsewhere in West Africa, Botswana, Kenya, South Korea and Indonesia have also reached mainly women of higher status, who have the time and interest to learn prestigious domestic skills (Wijk, 1985).

6.2.3 Women's resources for change

Time for education. To take part in health education and practise improved behaviour requires access to resources. Availability of time is the first such resource. Frequently, women lack the time to take part in hygiene education activities, especially when the times or places are not adjusted to their needs or the new practices require too much extra time and energy.

In Jamaica, government health staff only worked during the day when the women were busy with their own work. In the evening, when the women could attend meetings more easily, the health staff had gone home (Rojas et al., 1982). Male-organized meetings in Bolivia were also at inconvenient times (Karp et al., 1990). Distance and lack of time to attend health education meetings have also been reported for programmes in Benin, Burkina Faso, Guinea Bissau, Nigeria, Senegal, Zaire, India, Malaysia, Sri Lanka and South Korea (Wijk, 1985). An evaluation study in the Upper Region of Ghana found that only 16.7 percent of those reached by a health education programme on water use and hygiene were women (Harkness, 1983), even though their involvement as managers and

participants was one of the original recommendations in the development of the project (Hall and Merriman, 1977). Commenting on a project in Rajasthan, India, CDS (1994) writes: 'The project has paid much attention to women, but mainly as a way to reach the project's objectives (this author's emphasis). It recognized the limited amount of time women have for attending village contact drives. Yet it places an increasing demand on women's time by now asking them to form women's groups and attend meetings on water use and hygiene and not on poverty and income, the women's own priorities'.

Freedom to move. In cultures that demand the seclusion of women, access to health education is harder yet. Meetings at health centres are not appropriate because apart from demands on time and sometimes transport, this requires entering the public sphere (Wijk, 1985). The same cultural restrictions apply when village health workers are men, as experienced for example in Afghanistan (Malyai, 1980).

Access to and control over resources. To practice better hygiene, women need more water, time and funds, and permission to use these resources. Not always are they available or their use allowed. Women in Ethiopia said that they had neither time nor water to wash except during menstruation and that soap was too costly to use (Aziz, 1995; Morgan, 1996). In the wet season, Somali women will bathe babies daily, prepare two meals per day and wash utensils and clothes regularly. Under pressure of water collection work, social customs and organization, they will reduce water consumption in the dry season to 10 litres per person per day and less. Towards the end of the dry season, mothers reduced all washing and bathing and cooked only one meal per day (Roark, 1984). In Yemen, social rules give male members of the household and male guests the first right to the cleanest water. When sources are far away, women and children will restrict their water intake (Ansell, 1980). The Gogo people live in a dry area (Dodoma) in Tanzania. What water is available is used for drinking, food preparation and beer brewing. Selling beer is one of the few ways for women to make money. Washing children's faces is a low priority and women do not like to spend time and water on it, as they then risk being criticised by their neighbours and their husband for a wasteful use of a precious resource (McCauley et al., 1990).

Linking of health education to an improved water supply does not necessarily mean that better hygiene can indeed be practised. In Chapter 4, cases were already reported where some groups of users have worse access to this water supply than others or are even excluded. The system also has to function well. In Sierra Leone, collection of water from the new, closer, waterpoints took longer because of the inadequate discharge, causing long queues. As a result women's water use for e.g. hygiene did not increase (Bah, 1988).

Hygiene programmes are also known to promote practices that are unrealistic in the given circumstances. The boiling of water, for example, which health educators still advise, has to be done for ten minutes to be effective. It takes extra firewood, time (including time for cooling down) and an extra vessel for storage. As a practice, it may go against the culture in areas where people classify diseases as 'hot' and 'cold', and it gives water a disliked flat

taste. In addition, the risk of recontamination is great and the impact on health limited when other routes of transmitting faecal-oral diseases persist (Lindenbaum, 1968; Wijk and Murre, 1995).

Differential access to resources. Poor women not only have fewer opportunities to take part in educational activities; they also lack the time, financial means and access to credit to make health and hygiene improvements. Poor women in Mexico and Egypt mentioned lack of time, due to long waiting at standposts, and workload in water collection as well as their inferior housing conditions, as constraints to practising improved hygiene. Egyptian women from low-income households also were less likely to visit the clinics where health education sessions were held (Chant, 1984; El Katsha and Watts, 1993a). Female-headed households form a special group (Kudat and Weidemann, 1991).

The physical means for maintaining hygiene are less affordable to poor households than to those which are better off. In Bangladesh, soap was only affordable to higher income groups (Hoque and Briend, 1991). Elsewhere, handwashing with soap has also been promoted, though soap is either not easily available, or is expensive (Hannan, 1984; Kirimbai and Wijk, 1983; NICED, 1982; Morgan, 1995; Zeitlyn and Islam, 1991). Projects in Bangladesh, India and Indonesia which provided soap free found a positive impact on health. Two years later, with no more soap provided by the project, fewer women were using soap in the Indonesian study (Wilson and Chandler, 1993).

Poor women have mentioned the lack of direct relevance of health education programmes as a serious constraint. They feel time spent away from their families should contribute primarily to the family income (Acharya and Bennett, 1983b; CDS, 1994; Marum and Kaneez, 1981; Nazareno, 1981). Both men and women in a survey in three villages in Dhaka district, Bangladesh, gave shortage of food as their main concern (Laubjerg, 1984).

6.2.4 Attitudes and methods of educators

Programmes lecturing people on what they must or must not do, or presenting only abstract and general knowledge of the causes and methods of prevention of water- and sanitation related diseases, are rarely effective (Wijk, 1985; Wijk and Murre, 1995). There is a great deal of evidence that in all cultures, women, through their daily experience and observation, have acquired basic and practical knowledge of environmental hygiene on which health education programmes can build.

In Africa and Asia, discussions with women have revealed that the filtering action of river-bed wells and the slow recharge of dug wells are recognized as being beneficial to water quality (Rebers, 1990; Roark, 1984; Tanzania, 1984; White et al., 1972). Perceptions of contamination of water sources by animals, washing and bathing and also the safety of a closed water supply have been reported in studies in India, Sri Lanka, Botswana, Liberia and Swaziland (Wijk, 1985). The same author reports awareness of the harmfulness of adult excreta in studies in rural communities in Nigeria, India, Sri Lanka and Nicaragua.

The presence of basic knowledge on water, sanitation and health is also widely reported (Nibakure and Wijk, 1995; Pinfold, 1990a; Wijk, 1985: 14 studies).

The amount and differences of health knowledge of women and men, and the gaps and misunderstandings which exist, become more apparent in focus discussions and participatory exercises than in the more common knowledge, attitudes and practices surveys. The latter approach is only useful if beliefs, attitudes and behaviour are not categorised as 'right' or 'wrong', to be corrected by didactic teaching, but instead lead to educational programmes that reflect recognition of and respect for the local community and its framework of perception. Women in Peru have resented health education that '…. has been condescending, preachy and critical of the women's traditions' (Doucet, 1987). In Bangladesh, Boot notes how the health assistants never tried to make mothers participate and did not seem to care whether or not they learned. Consequently, the author remarks, these women were not interested in what the health workers had to say (Boot, 1995). A description of a programme in Nicaragua subtitled women's contributions as 'kitchen talk' (Young, 1989).

6.2.5 Influence on men

Improvements in public health are only possible when a substantial proportion of women as well as men, girls as well as boys, practise safe hygiene practices. When women have the means and freedom to do so, they can adopt better hygiene practises themselves. They can also practise good hygiene with their small children and bring them up to practise good hygiene by themselves (Elmendorf and Isely, 1981). Influence on peers is great. Section 3.4.1 in Chapter 3 gave many examples of how women convey health knowledge and influence practices through local learning systems. In a study in an urban fringe area in Durban, South Africa, discussion in local friendship groups reached more women and led to greater improvements in environmental hygiene than the more usual programme of mass media and training of formal leaders (Steuart et al., 1962).

While women can and do influence children and fellow women, in many cultures they also depend on the decisions of men, and cannot comment on or criticise the hygiene behaviours of husbands, older sons and other male relatives. In most of North Africa, the Middle East and Southern Asia, husbands control and take decisions on all major issues, including household investments (Grady, 1991; Wijk, 1985; WSC, ca. 1994). In a study on women's roles in water supply in Egypt, women felt powerless to influence local governments and their own husbands to institute new practices (El Katsha and White, 1989; El Katsha et al., 1989). Boot (1995) reports how women in Bangladesh, who had constructed latrines on their own, were unable to get their husbands to use them. Lack of attention to gender issues by hygiene programmes is apparent through the women's criticism of fathers for failing to provide good role models for children and to take an active role in their hygiene training. A study in Swaziland showed that the profile of a person with the greatest need for education on sanitation and hygiene would be the male head of a small homestead in the Southern Region. Those least in need of health education would

be younger and educated females in larger homesteads in the South (Green, 1982). Espejo and Pol (1994) stress how a gender approach in hygiene education is needed in Latin America to ensure that all family members change behaviour and share responsibilities.

Too great a focus on women has also resulted in reactions from men. In Zambia, when only women were selected as health educators, men tried to sabotage their training by not allowing their wives and daughters to participate (Boesveld, 1994). Assistance to especially women irked young men in Haryana, India and brought stiff opposition from husbands (Kumar, 1993)

Where women have their own plots or businesses, they can to some extent make their own decisions on smaller investments, but husbands decide on major issues and women depend on them for larger hygiene investments (Wijk, 1985). Male labour migration has led to a greater say for women in households (Gray, 1982; Naveed, 1981) but here also women's authority does not extend as far as men's behaviour and financial decisions (Blackett, 1994). Under such conditions it is not realistic to involve only women and girls in hygiene education and expect that they convince husbands and fathers to invest in hygiene practices and change males' unhygienic practices (Figure 20).

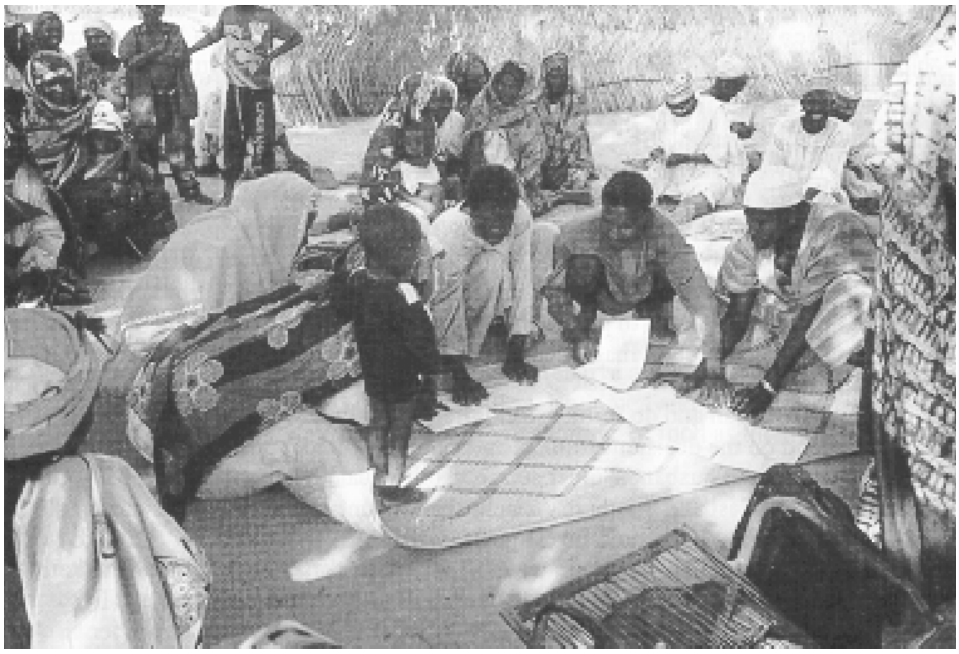

Figure 20. With a gender approach both women and men take part in hygiene education sessions and determine how work, responsibilities and resources are divided (photo: C. van Wijk, IRC)

6.2.6 Health education and equity

Within the household, men and women each have their own areas of work, responsibility and authority. Health education with women alone recognizes only women's important functions in water, waste and hygiene management and the education of young children. Sometimes, it stimulates women to start economic projects or a saving scheme and to invest the funds in hygiene improvements for the household. Well-known in this respect are the activities of women's groups in Kenya, who have rented themselves out as land labour to earn funds for their own rainwater harvesting tanks (Cumberlege, 1993; Gitau, 1992; Mbugua, 1994; Wacker, 1990). Elsewhere, groups of women have also started earnings or savings schemes, for example, to improve kitchen conditions (Wijk, 1985). Such activities have increased women's autonomy, self-respect, cooperation and technical and financial skills. However, women-only programmes leave their male partners' responsibilities for financing, care and education, and the own hygiene behaviour, unaddressed; nor do they do anything to redress what, in many cultures, is the already skewed division of labour between women and men. Rather, the women are urged to take on more work for the preservation of hygiene and health (Morgan; 1994; Wijk, 1994). By targeting 'mothers only' the intervention puts additional responsibilities on women rather than on the community as a whole, thus increasing their burden and reinforcing stereotypes. An emphasis on women should not imply that activities must be carried out by women only. Instead, it should reinforce the need for both men and women to address the issues. Water, sanitation and hygiene are community responsibilities and any new work involved must not become purely a women's burden (Morgan, 1994).

Health education with male heads of households reflects their responsibility for investments in, among others, housing conditions. It also recognizes that men, too, need to change their behaviour. Activities with fathers will counteract the impressions created by some programmes in health education and mother and childcare that responsibilities and work for, and enjoyment of, children rest only with their mothers (Albihn et al., 1982; Nash, 1977; Sumbung, 1984). A household survey in Zimbabwe in which 575 men and 1029 women were interviewed, revealed that 49 percent of the men expressed a need for hygiene education (Chinemana, 1986). Women have also pointed out the need for a more equitable involvement of men (Burgers et al., 1988).

6.3 Programme that recognize and reduce women's limitations

6.3.1 Overcoming resistance to women's participation

Programmes that recognize the opposition faced by women in some areas in taking part in health and hygiene education have taken measures to overcome such constraints. They have, for example, obtained support from male leaders (El Katsha and Watts, 1993b; INSTRAW and UNICEF, 1988; Pillsbury et al., 1988; Wijk, 1985; WSC, 1994) and have involved husbands in some of the activities, for example in projects in Ghana, India and Pakistan (BLG RD, 1994; Sai and Nsarkoh, 1980; Sörensen, 1992).

Elsewhere, women have found their own culturally appropriate solutions to this problem. Mother's clubs in the Republic of Korea and the Philippines have made the most negative elders official advisors to their clubs (Kincaid, undated), prepared a ceremonial dinner for their husbands at which the purpose of the programme was explained (Ho and Bong, 1979), or have had proud husbands accompany their wives to a formal graduation ceremony at the end of their course (Glasgow, 1983).

A interesting example of dealing with gender issues is how a health team overcame the resistance of husbands and fellow women to the increased washing of children's faces among the Gogo in the dry area of Dodoma.

> 'To demonstrate in a participatory manner what the real amount of water and time were to wash the children's faces the researchers organized a demonstration with women and men. The average woman with three children had estimated that she needed three litres of water each time she washed her children's face. The researchers organized a meeting with men and women in two separate groups. They first held up a litre can of water with a plug at the bottom and asked each group how many faces they thought they could wash with the water. The women guessed five to six, the men one to two. The researchers then invited volunteers in both groups to put their guess to the test. The men managed to wash 12 faces, the women over 30. This clearly demonstrated that washing children's faces was less of a waste of water and time than thought and laid a more fertile basis for a programme to reduce trachoma incidence through improved hygiene' (McCauley et al., 1990).

6.3.2 Taking access to resources into account

Time and place. Devices that save women time, such as well-functioning water supplies and grain mills have created space for other activities, such as education (McSweeney and Freedman, 1980; Poluha, 1990). Where this was not possible, programmes have succeeded in reaching women better at their work and meeting places (Pillsbury et al., 1988; Visscher, 1982). The choice of site depended on local socio-cultural circumstances. In Nigeria, where women do most of the marketing, a health education programme was transferred temporarily from the health centre to a stall in the weekly market (Ade, 1980). In Indonesia, women farmers in scattered islands were reached through a popular radio programme. The timing and themes of broadcasts were adjusted to the women's needs. Difficult terms are avoided and broadcasts take the form of meetings between women. To prepare the broadcasts, farm families are visited and interviewed. A competition with responses from listeners serves to assess results (Aini, 1991). Elsewhere, radio has been combined with other methods for greater impact.

In Guatemala in rural communities, women tend to gather for several hours at the local pila or communal washing place. After listing their health problems, a local health project prepared a series of tape recordings using several techniques for knowledge transfer and

behaviour change. A local girl was engaged to operate the tape recorder. Elements used in the tape were dramatisation (the happenings in a local family), authoritative statements from respected local health staff, reinforcement (reminders of earlier messages), localisation (interviews) and entertainment (music, stories). The design of the contents and the hours of operation were adapted to suit the times of visits to the laundry places (Colle, 1977). An evaluation showed that women appreciated the health information in particular. Scores on a health knowledge scale varied from 92 percent for daily listeners to 35 percent for those who never listened, as compared with 27 percent for a control group who did not receive the tapes and could not learn about the contents from the other women either. Measurement of behavioural impacts was limited to the reported application of a recipe for a new nutritious dish. Of the 70 percent of women who remembered the recipe, 58 percent had tried it at the time of the second survey (Colle and Fernandez, 1978).

A health education project in Yemen has made similar use of group sessions for listening to and discussing tape recordings. Here the women could not meet outside and the tapes were played in the house of a respected woman, usually a female leader of their clan (Ansell, 1980). Elsewhere, water collection places have been found to be suitable for small group discussions on water use and sanitation. In a Tanzanian project, group discussions were organized at water collection sites and informal gatherings, using locally made discussion posters. In addition, members of the village water committees made home visits to discuss how sanitation could be improved (Tanzania, 1984). In secluded communities, health discussions have been organized at family gatherings and informal meetings in women's homes (Wijk, 1985). Programmes have trained women workers, who subsequently visit women at home (MoFA, 1995; WSC, 1994; Carlaw, 1980). In Egypt, nurses were most effective in reaching the women who visited the clinics, but volunteers were most effective in reaching and influencing illiterate women at home. A problem was the high turnover among volunteers, something also reported in Pakistan (El Katsha and Watts, 1993).

Women's participation in health education and other health related development activities has also been facilitated by the provision of child-care facilities. In a rural community in Sri Lanka, the public health inspector and community health volunteers failed to raise interest in follow-up to a community self-survey on health problems until the felt needs of the mothers (which included a day care centre) were addressed (Gunatilaka, 1980). In Vietnam, the provision of crèches has enabled women not only to take part in economic work outside their households, but also to participate in small group discussions on hygiene and family planning, and to support rural health centres. Their participation has been essential for the health movement as a whole, and where they have not been mobilized, results have been poor (McMichael, 1978).

A number of studies found that women at home were well-reached by radio or television (Aini, 1991; Kurup et al., 1996; Seidel, 1993; Tunyavanich et al., 1987; Wijk, 1985; Zimicki, 1993). Sometimes, however, women did not have control over this asset, or the time, contents and style of the broadcasts were not adjusted to their interests and possibilities.

In a case in India, it was found that women did not have practical access to broadcasts because their husbands took the radios with them all day (Etherton, 1980). In Yemen, women did not watch women-oriented health education on television, because the broadcasts were scheduled at an inconvenient time, used an unfamiliar vocabulary, lacked a human interest and provided messages that could not be applied (Holstein and Huraibi, 1979). Other mass media programmes have used time schedules, styles and methods that were much more appealing to the women and so had a larger impact. Some of them also involved men. This is discussed further in the sections on method and male/female participants below.

Goods. To improve hygiene, easy access to enough water and other materials for practising hygiene is essential. In Dosso, Niger, where soap for handwashing is not easily available and affordable, the hygiene and sanitation programme included a course in traditional soap making for women. Soap is now observed at many of the installed latrines and bathing places, and the women also sell soap locally and to traders in nearby Nigeria (Madougou, 1995; Sy Koutou and Wijk, 19965; Nibakure and Wijk, 1996). Women themselves have used ashes, sand or leaves and dried fruits of plants. The study of Hoque and Briend (1991) into the effectiveness of these substitutes showed that they were as good a cleaning agent as soap. Soap itself can become an agent in transmitting bacteria. Researchers at Michigan State University found a film of water with bacteria on soap in use and showed that the bacteria were transmitted during washing (McCormak, 1984).

Water transport, hygiene and health. A closer and more plentiful supply of water has, also without health education, enabled women to collect more water. A wide range of studies has indicated that more water is used when an improved water supply is installed (Wijk, 1985; Versteylen, 1991). The extra water is used for productive purposes, for example, in Indonesia (Narayan, 1989) and Burkina Faso (Hoffman, 1990), and/or for better hygiene and preparing more meals (Cairncross and Cliff, 1987; CARE, 1994). Mothers in Mueda, Mozambique, who had a piped water supply nearby used 11 litres of water per person per day, against the four to eight litres of mothers without such a service. Seventy percent of the extra water went to more bathing and clothes washing. As a result, incidence of trachoma, an eye disease related to insufficient facewashing, was 38 percent lower in villages with an improved water supply than in those without (Cairncross and Cliff, 1987). Access to piped water in Malaysia halved child mortality in families with literate mothers and reduced it by over two-thirds in those with illiterate mothers (Esrey and Habicht, 1988).

Families which have to walk for longer distances to collect water, or which have to wait a long time at the waterpoint, have not increased their water consumption (Bah, 1988; Tanzania, 1987; Simpson, 1993; Wijk, 1985). This has an impact on child diarrhoea: children from homes in Nicaragua with water supplies over 500 meters from the house had incidence rates that were 34 percent higher than children in households with their own water supply (Gorter et al., 1991).

Other means of transport. The above cases all concern households with a waterpoint close by. Very little study has been done on the relationship between hygiene and water consumption and the presence and use of other means of transport. Curtis (1986) has described a wide range of such means of transport. A study in a village in northern Tanzania has shown that such solutions can be quite cost-effective. Women and children in this village carried in total more than 32,000 gallons of water per year over a distance of almost a mile, at a labour opportunity cost of 25 cents per gallon. The acquisition of an oxcart to carry a 40-gallon drum would reduce this to 10 cents per gallon, covering capital and operating costs, and result in a slightly greater quantity of water available for domestic use (McPherson and Jackson, 1975).

The literature on water transport and health makes some mention of the effect of other water transport facilities on water use. In a household survey in Kibwezi, a dry area in Kenya, Absalon (undated) found that with transport, households used 2 to 5 litres more water per person per day. Those who used the transport were mostly men. In the total sample three quarter of those collecting water were women, and 90 percent of them had no transport means by which they could increase water use.

Men have tended to help in water collection when sources are farther away and have used their own means of transport for such purposes (Wijk, 1985). It has not been investigated whether hygiene education induces them to do so also when sources are closer. Nor is it clear whether women will be allowed to use such transport means for water collection. In her study on transport Carr (1983) found that within the household, the men own and control the means of transport and will use them for men's work, leaving carrying to the women. She also found that women have had problems in the operation of transport means which have not been designed for their use, for example, when from childhood women have developed muscles for carrying instead of pushing.

Chlorination. Sometimes water is available so nearby that there is no need for improving water transport during the whole or most of the year. This is the case, for example, in Kerala, where due to the high groundwater table, almost every family has its own well. Since women tended not to use communal taps at some distance, when they had enough water on their doorstep, the Socio Economic Units Foundation (SEUF) started a programme to chlorinate these wells. A local women’s organization repackages chlorine powder into ready-to-use sachets for well chlorination and sells them to the households in the surrounding communities. If so desired, the promoters also carry out the chlorination (Kerala State Pollution Control Board, 1991; SEUF, 1992). Programmes for the chlorination of drinking water have also been reported in West Bengal (Institute of Child Health, undated) and Colombia (Rodriguez, 1978). The women operated the pot chlorinators and kept track of the operation time by their menstrual period.

Measurement of water use. In contrast to studies reporting more water use and better hygiene, there are also studies that report no or very small increases in water use after the introduction of a new water supply. Several also found no connection between increased

use of water and reduced distance or collection time. Wijk (1985) explains these apparent contradictions partly by reference to methodological problems in collecting information on water use. Oral reports of how much water is brought into the household may not always be reliable, as water use varies considerably from day to day. Also, small quantities collected by children tend to be forgotten. In addition, water used directly at the source, for example for clothes washing, is not always included. Studies based on measurements or observation are more reliable, but may reflect special circumstances. Factors reported to increase the amount of water collected include, for example, the seasonal use of rainwater, the high socio-economic status of the household and expected interruptions to the supply. In addition, continued use of traditional sources for particular purposes, such as clothes washing and bathing, will affect the amount of water used from new systems.

Where there are no house or yard connections, it is thus difficult to generalize whether an improved supply leads to the use of more water for personal and domestic hygiene. Frugal habits and the lack of assistance or means to transport and store water may also explain why some women do not use more water when the supply is improved. Anne White stated in a study on water use patterns: 'There is no entirely satisfactory explanation of why one woman will struggle home with 40 kilograms of water on her head, while another is content with much less' (White, 1977: 108). But in all cases it is clear that good hygiene habits become easier when there is enough water nearby.

Finance. Occasionally, health education programmes have responded to women's requirements for financial means. For example, in Kerala, India, the Health Department changed its approach after evaluation meetings with women and began income-generating activities until the women themselves expressed interest in health education (Srinivasan, 1981). Similarly, attention to the practical needs of women (income generation, ancillary equipment, such as basins, soap and locally made water filters) as part of or preceding health education programmes has been reported in projects in Bangladesh (Hoque and Briend, 1991), Indonesia (Wilson and Chandler, 1993), Thailand (Pinfold, 1990a) and Burkina Faso, Cuba, Guatemala, India and Pakistan (Wijk, 1985). Questions of sustainability of the provision of materials and gender equity in financing are not addressed in these programmes.

6.3.3 Using responsive and enabling education methods

Evaluations have demonstrated the effectiveness of active participation by groups of users in discussions on health conditions and behaviour. Programmes which use one-way information transfer (lectures, films) directed to individuals were found to be not very effective in achieving behavioural change. Programmes using a participatory or user-adjusted (social marketing) approach have better results (Pillsbury et al., 1988; Wijk, 1985; Wijk and Murre, 1995).

In social marketing, or public health communication programmes, research serves to find out the interests, demand and communication channels of the different categories of

people whom the programme will address. The programme is then tailored to the interests and potentials of the different groups. Further research is carried out to adjust the programme as needed (Burgers et al., 1988; McKee, 1992; WHO, 1993).

Box 6. Public health communication for selected behaviour change

In the combat for better child survival Honduras and Ecuador established national programmes which undertake public health education on a massive scale. The programmes use a combination of mass media and personal contacts and group discussion to link a wide outreach with effective change. In Ecuador, mothers were stimulated to listen to the broadcasts in groups using a booklet and follow the session up with discussions. Each of the 36 broadcasts consisted of a brief introduction, a soap opera, summary messages, group exercises and a possible community action. Local health promoters facilitated the sessions. Mothers who took part in all sessions got a diploma, a door sticker and a set of sachets with oral rehydration mix (Seidel, 1993). In Honduras, the programme focused on measurable change of four hygiene practices: a hygienic and covered latrine; payment to maintain the community water supply; covered drinking water storage vessels and a ladle to draw water from the vessel. Broadcasts consisted of 60 fifteen-minute episodes of a comedy series featuring community men and women analysing water, sanitation and hygiene conditions. In addition, 120 one-minute radio spots were broadcast twenty times a day, six days a week. The broadcasts were followed up by group discussion meetings, organized by the local health promoters and featuring flipcharts and photonovels. They were also linked to a hygiene promotion programme in schools. Each teacher had a guide and a set of training modules and each student a comic book. Topics of broadcasts, school programme and group meetings were closely related to be mutually reinforcing. A survey in Honduras showed that at the end of the course 75 percent of the target groups practised two or more of the four promoted practices (Vigano, 1985)

Seeking to know and respect the hygiene concepts of the men and women in the communities has enabled programmes to adjust to local concepts on health and hygiene. Programmes in Bangladesh and Guatemala learned, for example, that for families soap was not related to health, but to prettiness (WHO, 1992; Zeitlyn and Islam, 1991).

In participatory programmes with local communities and groups, creative learning methods, techniques and tools are increasingly used. These allow the participants to analyse local conditions and practices building on their own, as well as the educators' knowledge; to collect information, raise awareness and understand how access to and control over resources are gender- and class-based; to plan and organize for creative problem solving, using in the first place the groups' own resources; and to monitor and evaluate progress and results (Almedom and Chatterjee, 1995; Narayan and Srinivasan, 1994; Srinivasan, 1992; Vigoda, 1995; Wijk, 1985; WSC, undated).

6.3.4 Targeting men

Hygiene education programmes that also target men are still in the minority, but do exist. In Haiti, health promoters organize group discussions with women and men, but there is no link with local conditions, demands and potentials of women and men in the different socio-economic strata, and the focus is on knowledge rather than conditions and behaviour (Yacoob, 1989). Projects in Kerala, India, Ethiopia and Afghanistan used participatory techniques in focus group discussion to find out for what tasks men, women or both are responsible (Almedom et al., 1997; Kumary et al., 1996). Both field workers and women

who participate in the hygiene promotion work of the Women's Voluntary Service in Madras, India acknowledge how essential it is that also their husbands are participating in the programme (Sörensen, 1992).

In Baluchistan, husbands get separate health education, as wives cannot directly influence the behaviour of their husbands. Hygiene education is used in particular to motivate the men to build and use latrines, as they have no privacy problems themselves and are shy to visit latrines under the eyes of the women (WSC, undated). Research into hygiene risks in Bangladesh revealed as priorities for action mothers washing hands before preparing food, safer defecation habits of young children and safer disposal of garbage and faeces. The latter would reduce the risk that young children place waste products in their mouths. From these findings, action programmes with mothers, children and fathers were developed. Subsequently, the rates of diarrhoea in children under six were 26 percent lower than in the control area (Clemens and Stanton, 1987).

Burgers and others (1988) mention four programmes that also target men: an early water supply project with male health education in Uttar Pradesh in India (Misra, 1975); a health education programme in Tanzania which originally only focused on women (Healey, 1975); a participatory hygiene education programme in Guatemala (Tonon, 1980); and a public health programme in a low-income area in Japan (Miyasaka, 1971). The programme in Japan changed from a mass programme to a community-based programme with environmental self-surveys and special environmental health classes for mothers, fathers and grandmothers. This resulted in a 29 percent increase in health knowledge, a 12 percent increase in kitchen improvements and 90 percent incidence drop in intestinal parasites. The programme in Tanzania changed its focus after a study had shown up the need for a gender approach:

> 'Local research in the Maswa District has revealed a very interesting fact. If women alone attend the course, they return to their homes with new ideas and methods only to meet opposition and resistance from their traditionally-minded husbands. So husbands are encouraged to attend the five-day course, or at least come occasionally during the day to see what their wives are learning. One pamphlet on Benefits of Clinics has been prepared especially for fathers to read' (Healey, 1975: 99).

Similar experiences are reported in Bolivia, where some husbands were reluctant to allow their wives to take part in hygiene education. They saw this as a waste of time or an interference with their wives' duties at home. The presentation of health information to the men was undertaken to increase their understanding and approval of health activities, get scope for the women's involvement and encourage to some degree the direct involvement of men in community health (Karp et al., 1990). Health educators in Togo brought in gender when they adopted a learning approach.

> ‘Seeking to avoid lecturing at villagers about “the right way” to do things, project personnel encouraged villagers to identify local problems and then to find solutions themselves to the problems they had identified. That the information provided was tailored to specific target groups according to function and gender (emphasis CvW) was an added advantage of this approach’ (Pillsbury et al., 1988: 33).

Programmes in Madras in India, Jogyakarta in Indonesia and Baluchistan in Pakistan have also addressed husbands. In Baluchistan, contents of hygiene programmes for women differ from those for men (BLG/RDD, 1994). In Madras, half of the husbands came when joint meetings were held. The programme had found that husbands’ participation was necessary, as tasks and authority on environment-related issues are divided along gender lines and men often co-decide in domestic decisions (Sörensen, 1992). Another Indian programme used participatory rural appraisal to identify gender and ethnic differences in hygiene perceptions and practices, before starting a hygiene promotion programme (Bhai, 1994). An experiment in Jogyakarta in Indonesia organized hygiene sessions with women in their clubs and reached men through male leaders and microscope demonstrations by sanitarians. This resulted in achievements in latrine installation, use and hygiene which were significantly higher, and percentages of worm infestation which were significantly lower than in the control community (Soeripto, 1989).

PIACT, a health programme in Mexico, found that breaking through gender stereotypes was easier than thought and was welcomed by both men and women in the programme villages. When designing its materials to promote sanitation and oral rehydration, the organization took the usual steps. Programme researchers visited homes and learned about health care habits. They consulted sociologists and other experts about customs. They tested the education materials and made adjustments. The final product was an illustrated brochure that depicted only women, as everyone took for granted that only women performed these duties. Some researchers still wondered about this and asked 60 mothers and 30 fathers of young children whether fathers helped. Sixty three percent of the mothers and 70 percent of the fathers answered in the affirmative. So PIACT produced a second brochure with fathers and mothers involved (Figure 21) and tested both versions. Everyone understood both brochures equally well. None thought it unusual or silly to see men help. Two-thirds of the men and women preferred the second version. Many explained that the presence of both parents made the pictures more complete. Some said that men will see that not only the women can take care of the children. Based on this development, the second brochure was chosen and used (PIACT, 1982).

‘Mtu ni afya’ or ‘man is health’ is a well-known public health education campaign which used radio listening groups and took place in Tanzania in the 1970s. During three months a twice-weekly programme was broadcast for listening groups. Under the

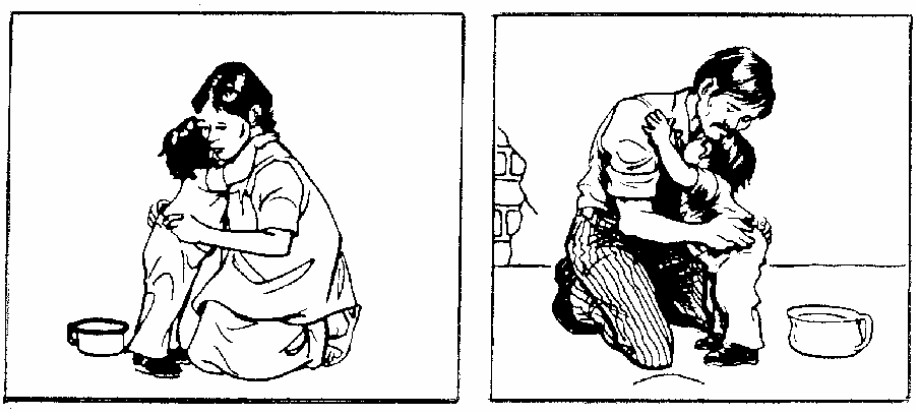

Figure 21. First and second version of hygiene promotion material: after testing with women and men also pictures with fathers were included in the material

guidance of trained group facilitators, the particular theme was discussed by the group after the broadcast and a follow up action planned and implemented. Ideally, each group chose its facilitator. Facilitators were trained to avoid developing a teacher-pupils relationship in their groups. The groups had a good gender balance in membership: 49 percent were women. However, the attendance of women was lower than that of men: 38 percent versus 62 percent. This probably reflects both practical and strategic gender constraints. Pre-and post-tests showed a knowledge increase of 11 percent and a mean improvement from three to 4.5 hygienic practices, with latrine construction as the greatest gain (Hall and Dodds, 1974; Hall, 1978). Similar campaigns are also reported in Botswana (Enge, 1983), Honduras (Vigano, 1985) and Ecuador (Seidel, 1993), but without any information on gender characteristics.

To reach women and men with hygiene education, several programmes have used development theatre. Some of these programmes only pass on standard information and have been derogative of women which has caused reactions from the women in the public (Levert, 1995). Others have given scope for a gender approach in several respects. They have brought out gender concerns and give gender messages which they could not have given in public meetings and have challenged stereotyped roles for women and men (Wijk, 1997a).

Only reaching the men is, however, not enough. A national hygiene promotion campaign in India managed to reach men through five out of six media: radio, film, television, school teachers and health workers. Only nursery teachers were slightly better able to reach women (32 percent) than men (30 percent). The best medium, radio, reached 73 percent of the men and 54 percent of the women. Yet despite their lower level of access to almost all the media, 12 percent to 16 percent more women recalled the messages than men (Mukherjee, 1990). This shows the need to not only tailor the media, but also the contents of hygiene promotion activities to gender differences in access and responsibilities.

6.3.5 Programmes addressing gender inequity

So far, programmes that address gender inequalities in health and hygiene work, responsibilities and resources are scarce. Some materials have been produced that help women and men look at the gender-based division of work, resources and decision making and come to their own conclusions and action points. One such is the set of drawings 'Why Mama is Tired' used for participatory hygiene education by the WASHE project in Zambia. The drawings show the many health- and hygiene-related tasks of women. Reviewing these drawings and putting them in a logical order form the basis for a discussion on the extra time and energy that women are asked to spend on yet more work in water and hygiene (Harnmeyer, personal communication). Other materials are the card sorting pictures developed by the project for promotion of the role of women in water supply and environmental sanitation (Wakeman, 1995). Using a series of cards depicting a man, a woman and a couple, the participants can put small cards with pictures of various types of work around the man, the woman or the couple, indicating who does what and how the work is divided. In the same way they can distribute cards with pictures of resources and assets, indicating who has access to what resources and who controls what assets.

Card sorting and mapping exercises help participants to divide access according to rich, average and poor households. Sorting cards with women's work allows women to comment on this work and assess their needs and opportunities for improvement. Cards depicting public assets and decision-making sessions help classify decision making by gender in various sectors. Participating appraisal materials are also used to map male and female realities and tasks and bring in a class aspect (Figure 22). As far as is known however, the use of such tools had not yet let to a redistribution of work and resources for health and hygiene by gender and class.

That gender analysis can redistribute work and resources is shown by the case of a resettlement programme in Tanzania. One of the advantages used in promoting the programme was that in concentrated villages all people could get a piped water supply as well as other basic services, such as schools and health posts within a short walking distance. However, in resettlement women lost their original rights to land, their right to choose a male leader for their sub-clan, their economic independence and their right to voice opinions. When the male researcher discussed these impacts with the village men, the latter recognized the injustice and nearly 90 percent voted for a statutory regulation to redress the situation. The majority then voted to give women 10 percent of the family income to compensate for their loss of resources. Women also got a voice in all village decisions and an equal share in profit from joint enterprises. Working hours in agriculture were redistributed to take account of women's domestic work, including water collection and hygiene. Women's hours in the fields became 8-12 a.m. and men's became 7 a.m. to 3 or 4 p.m. The arrangement lasted for three years and included eleven villages. Government officials then disbanded the system, because it was considered subversive (Brain, 1976).

In general, however, most hygiene improvement programmes do not yet use a gender approach for more effective results and avoidance of negative impacts on women. This is clearly an important area for development in future hygiene improvement programmes.

Control on water source in terms of ownership and distribution – gender wise

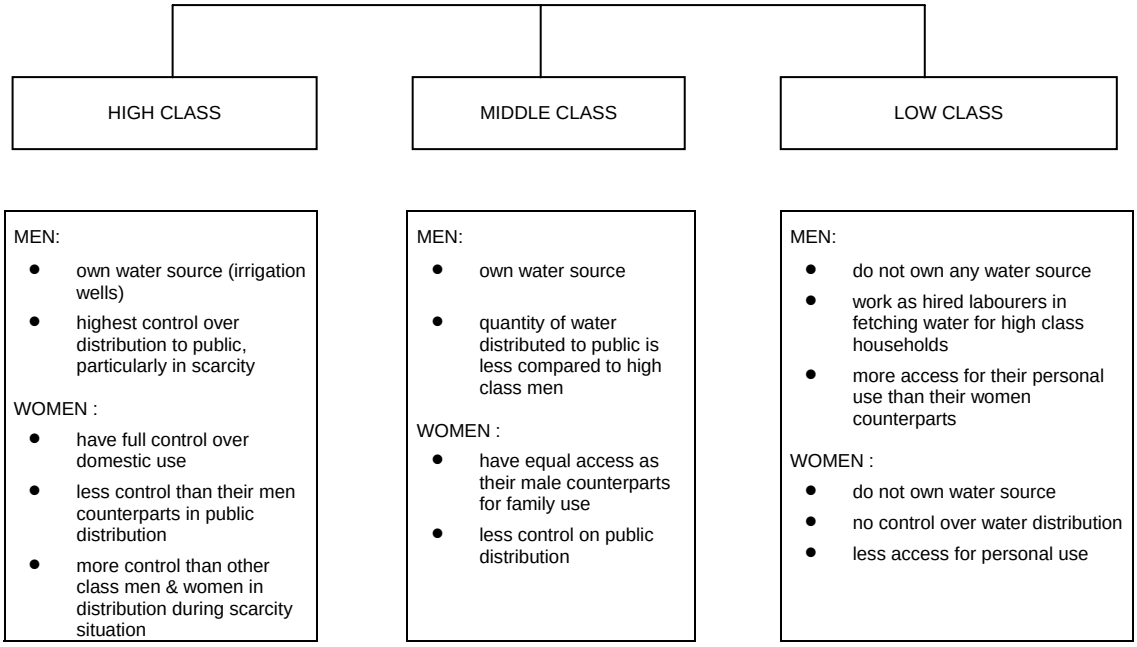

Figure 22. Participatory rural appraisal was used in Karnataka to identify and analyse gender and class divisions in amount of water collected (source: PSU, Bangalore, unpublished report)

7. Enabling Agencies

So far this book has reported on data concerning the gender relations in water supply, sanitation and hygiene programmes. It has reviewed the new policies on water resources management and exposed the gender side of its principles. Experiences with the application of these principles in the water supply subsector have been reported. This chapter looks at the organizational context, which enables the new approaches. It describes how organizations shift from centrally managed, technically oriented and gender-neutral programmes to more demand-responsive, decentralized programmes. The latter combine hardware and software and recognize the realities of gender, class and ethnic differences The critical combination of enabling factors is yet to be identified.

7.1 From implementing to enabling agencies

Recent history has seen a shift away from serving mainly the better off households with centrally managed services. Present aims are to also reach lower and lowest income groups with facilities that improve their water supply, sanitation and hygiene conditions and that they can afford (Grant, 1994). Hence most water supply and sanitation agencies now work with several technologies and service levels. Next to pumped piped water supplies serving large populations they also help communities build single or small-scale multiple schemes with public, group, yard or house connections, with or without water treatment systems; handpump wells and sometimes also rainwater harvesting systems and protected wells.

A greater number of water supply systems, including many small and relatively simple technologies, also lead to a greater range of management and financing systems. There are on-site facilities which individual households own, manage and finance or co-finance. There are also on-site facilities and small systems that a group of households, a community or a group of communities share. They manage the service and finance the recurrent costs. Often they contribute to investments. Finally, there are comprehensive systems of varying complexity for many communities and households, which a utility manages on behalf of the ratepayers, or in which the utility and user communities share the management. Some comprehensive schemes (usually gravity) the user communities themselves manage and finance operationally, either directly or through some kind of association or water board.

Sanitation systems also can be individual household facilities; shared and group managed facilities such as a sanitation block; or a combination of community and utility management, whereby the primary system is run by the community or the local private sector and the secondary system by the utility or government agency.

This greater variety of systems and the different degrees of decentralization and devolution mean that the role of water and sanitation agencies is changing drastically. They directly

manage some systems, but in other cases help local communities and groups to choose, plan, construct and manage their own systems with a maximum of local resources and skills (Evans and Appleton, 1993; Grant, 1994). This means a radical change in the way of doing things, including, as the previous chapters show, working closely with men and women of different socio-economic and cultural backgrounds. Matching plans and designs to local conditions, and strengthening the skills with which men and women plan and manage their service, become central (Evans and Appleton, 1993).

Establishing community-managed services requires not only preconditions for community management (McCommon et al., 1990) but also for issues of gender and class (Table 6).

Table 6. Gender and class specific preconditions for community management

Preconditions for community management	***Gender and class adjustments***
There must be community demand for an improved system.	Demand of men and women in low, middle and high economic strata has been ascertained.
The information required to make informed decisions must be available to the community.	Women and men of different socio-economic levels have access to the information, which reflects their gender and economic interests.
Technologies and levels of service must be commensurate with the community's needs and capacity to finance, manage and maintain them.	The programme offers choices in technology and service levels, financing and maintenance and management systems, which enable men and women of all sections to participate without exclusion or disproportional benefits.
The community must understand its options and be willing to take responsibility for the system.	Men and women of the various strata are consulted about the options and generally supported choices are made.
The community must be willing to invest in capital and recurrent costs.	The system of co-financing ensures that the contributions in cash and kind are distributed fairly between the different classes and between men and women in these classes.
The community should have the institutional capacity to manage the development and operation of the system.	The programme has assessed the willingness and capacity of men and women and strengthens the management capabilities of both groups.
The community should have the human resources to run these institutions.	The programme trains women and men in old, but also new roles, and women and men share paid and unpaid jobs.
There should be a policy framework to permit and support community management.	The policy framework includes goals, objectives and indicators for access to all and for gender.
Effective external support services must be available from governments, donors and the private sector.	The support services support 'some for all' rather than 'all for some' and have and use a gender strategy for implementation.

A class-sensitive gender approach ensures that control, outputs and benefits are not limited to a small elite, but are widely shared. This not only has the functional benefits of more general support and use and a better performance, but also gives women a more equal position, as they share in decisions, functions and training (Evans and Appleton, 1993). A gender approach goes beyond having an equal number of trained women and men on a committee. Not the more numbers, but the division of work, pay and influence reveal the degree of gender-sensitiveness.

The new, more diversified management systems – some conventional, others designed with and managed by local women and men, or co-managed between communities and agency - ask for a much greater mix of expertise, knowledge and skills
in water and sanitation organizations. They also require adjustments in the management of staff, as the work goes much beyond technical design and construction.

> 'To become less bureaucratic and more enabling, an agency must examine every aspect of its work…. Does an agency's staff have any reason to care whether they have an effective service, and if so, whether it is valued by the people? Do participatory approaches for appraisal, analysis, planning, implementation and monitoring and evaluation result in the selection of viable projects, programmes and processes? Do internal structures and management systems support effective problem solving? Do existing budgetary procedures allow local adaptation and flexibility in investment and disbursement? …These and other conditions will need to be examined concurrently with efforts to introduce a new participatory approach' (Thompson, 1994: 57).

7.2 Expertise for balanced participation

7.2.1 Engineering and school education

The expertise required for enabling communities to plan and manage their local systems in a way which equitably favours and burdens men and women of different backgrounds is traditionally not present in water and sanitation agencies. Most engineers in charge of developing water and sanitation systems are educated and trained in technical aspects, and much less, or not at all, in management and socio-organizational aspects (Wijk, 1985).

The engineering sector is predominantly a man's domain (Arboleda, 1994). Building the domain starts at a young age. Socio-cultural norms mean that parents let boys go to school, while girls stay at home to assist the mother. This is reinforced by poverty and an increasing demand for contributions from parents in children's education. When not all children can study, it is the sons who get the chance, not the daughters (Jongepier and Appel, 1995), although World Bank studies have shown that investments in girls' education have economic benefits (King and Hills, 1993; Summers, 1992 in Fong et al., 1996). At least in Africa, fathers in particular appear to hinder girls' education. Surveys in five African countries revealed that in female-headed households sons and daughters are likely to be better educated than in male-headed households (Goutier, 1995).

At school, also gender imbalance is stimulated (Chitsike, 1995). In some countries steps are taken to redress this. In Tanzania, Sida assisted in the formation of a national reference group to evaluate teaching material from a gender perspective. The group found that women were portrayed only in their domestic roles and that texts tended to belittle women. The Ministry of Education has given the group a role in the reassessment of teaching materials and curricula. A national reference group in Ethiopia is doing the same in their country (Stenvang et al., 1990). A school programme in Botswana introduces both

boys and girls to the water and sanitation sector and encourages girls to pursue a career in this sector (Botswana, 1994a). Teachers get a guide with forms to assess attitudes towards education and careers for sons and daughters, and with activities to stimulate girls' interest in issues such as water quality testing and recycling of wastewater and solid waste (Botswana, 1994b). Although female engineering staff do not necessarily have a gender approach, they do facilitate communication with women, and also provide role models for other women (Chitsike, 1995). To ensure more social expertise and more women on projects and programmes, various staffing models have been adopted. These are discussed in the next section.

7.2.2 Multi-disciplinary expertise, staffing models and gender

Countries adopt various models to bring social and health expertise into water supply and sanitation projects and programmes. Five such models can be distinguished:

1. The technical agency gives an additional social role to its engineering field staff. They are also responsible for realizing community participation and seeing that local organizations are formed and trained to maintain the established service and finance its running, and often also part of its investment, costs. For health aspects they liaise with the local health service. At the agency level there may be a social expert or unit with social expertise to develop and test strategies, train staff and provide backstopping services. Examples of this strategy are found in Guatemala, Colombia and Malawi (IRC, 1988, 1997).
2. Technical, social and health departments cooperate in implementing an integrated approach, in which improvement of water supply takes place together with improvement of sanitation and hygiene conditions and behaviour. This is the approach taken in, for example, Tanzania (IRC, 1993).
3. Where there is a shortage of field staff in the social service department, staff from other departments, such as agriculture, education and forestry may also take part. An example is Guinea-Bissau. The rationale is that with limited resources it is better to concentrate on one demanded priority first. The participatory approach and skills extension staff from other sectors master on water projects will later benefit programmes and projects in their own sectors (IRC and UNICEF, 1995).
4. While technical agency staff do the technical work, NGOs take up the process of organising the community and bringing its members into decision making. They also play a role in preparing community members for local maintenance and management and see that weaker sections get equitable access to services. Examples of this strategy are found in India and Sri Lanka (Netherlands Ministry of Foreign Affairs, 1990; Fernando et al., 1997).
5. The technical agency engages also social staff. They may either be part of the overall agency, as are the promoters in rural water supply programmes in Andean countries, or be located in a special social wing. An example is the Servicio Autónomo Nacional de Acueductos y Alcantarillados (SANAA), the autonomous national water supply and sewerage service in Honduras. To develop the specific expertise for projects with low-income urban neighbourhoods, the service has established a separate wing, Unidad

Ejecutora de Barrios Marginales (UEBM) in its organization. The wing has both technical and social specialists (Espejo et al., 1993).

A number of authors have pointed out the limitations of one model or the other. Technical staff do not necessarily have the required social expertise, even when recruited and employed for personal commitment. Cooperation between departments has led to conflicts over coordination, competence and leadership when there is no leading department that is able to combine technical and social interests and be acceptable to all (IRC, 1993b). Some NGOs are only fronts to promote factional interests, or have an outdated welfare perspective (Hecht, 1995; Murthy, 1993). NGOs also do not always have the capacity and interest to work on a large scale. Differences in the development views and approaches of different NGOs involved in the same water and sanitation programme cause special management problems (Nehterlands Ministry of Foreign Affairs, 1990). Having social and health activities executed by other organizations has also given technical staff an excuse not to adjust their own ways of working (Wijk, 1994). So far, however it has not been systematically established what the advantages and disadvantages of each model are and which model works best under which circumstances.

Gender balance in staffing

Recognition of the need for multi-disciplinary cadres and linkages between socio-organizational, technical and health staff have brought a greater balance in ratios of male and female staff (Figure 23). More female project staff certainly help local women to participate in the projects. More women in jobs do not, however, ensure that the programme will use a gender approach. Carrying burdens together and sharing benefits require gender consciousness and strategies from male and female staff alike. The next sections will review how institutions are developing the attitudes, skills and strategies and how they facilitate their application on the job.

Figure 23. Training of village sanitation workers in Orissa, India: by involving men and women, the project recognizes and builds on gender-specific responsibilities, demands and influence, thus combining direct project benefits with a greater gender equity (photo: UNICEF)

tools continue to be developed and existing ones refined and adapted. Some which focus specifically on gender can be found in Wakeman, 1995. Ideas exist to further develop this gender perspective as part of the work of the Gender Issues Network of the Water Supply and Sanitation Collaborative Council..

Development agencies increasingly use PRA techniques to enable community members to express their knowledge and views, analyse situations, research possible improvements and plan, monitor and evaluate interventions. The International Institute for Environment and Development developed a set with guidelines and over 100 games and exercises to practice participatory rural appraisal with a gender perspective (IIED, 1994).

Several other organizations have developed gender tools. The Ecology, Community Organization and Gender (ECOGEN) project, a research project of Clark University and the Virginia Polytechnic Institute and State University with institutions in Kenya, Honduras, the Dominican Republic, the Philippines and Nepal, documented tools which provide a gender modification to commonly used methods and techniques such as wealth ranking, in-depth household interviews, focus group discussion, participant observation and resource mapping. The tools are classified according to their use in problem identification, project design and implementation and project management (Thomas et al., 1993).

In 1994 groups of female and male middle level managers in participatory water supply, land and water and sanitation projects documented their gender approaches in inter-regional workshops. The group in Asia documented the tools which they use to address a wide range of identified gender constraints (Bolt, 1994). The participant from Nepal later presented some of the tools at the NGO Forum of the International Women's Conference in Beijing (Ale, 1995). The group of African managers wrote down their experiences in addressing gender throughout the gender cycle (Boesveld, 1994). The Latin American managers described their experiences with gender and gender approaches in key processes in domestic and agricultural water supply and sanitation: gender in diagnostic studies and community organization; the management of technical systems and the environment, and the monitoring and evaluation of the project (Espejo and Pol, 1994).

Besides tools, checklists and guidelines have also been prepared (CIDA, 1997a, b; DGIS, 1989 and forthcoming; FAO, 1982; FINNIDA, 1994; Jahan, 1995; Matrix, 1993; NCRFW/NEDA, 1993; OECD/DAC, 1992; Sida, undated ca. 1997; Wijk, 1995; Williams et al., 1994). Some external support agencies have introduced gender impact assessments as part of project appraisal (Lingen, 1994; FINNIDA, 1991). Guidelines may concern gender alone or be combined with poverty and environmental analysis. Checklists and guidelines have had an effect on actual practices, provided they were used in combination with other strategies and aids, such as policies, research, human resource development strategies and analytical tools (Woodford, 1982; Jahan, 1995 in Wakeman et al., 1996; Sida, 1997).

7.3.3 Referees, gender specialists and gender units

Gender experts who know the water and sanitation sector and can guide the actors on a team are important at all levels. In Sida, gender training had an impact on knowledge and attitudes, but it became clear that applying skills needs more on-the-job guidance. Follow up sessions for each division, which focus on gender in projects at hand and monitoring implementation, are now going on (Hannan, undated). Moreover an extensive review of experiences on gender equality was carried out, resulting in a special policy and action plan. Sida's heads of departments are responsible for implementation and the Director General and Management Group will monitor progress (Sida, 1997). In the field, the presence of one person with a strong commitment to gender issues was able to ensure that a water or sanitation agency acted on these concerns (Davis in Wakeman et al., 1996; Mathew in Kurup et al., 1996, Kwaule, 1994; Sharma, 1989).

Yet the participation of gender specialists in project identification and preparation is not effective unless they are integrated into the overall team and gender expertise is also present during implementation (Wijk, 1985). Nor do studies necessarily lead to a more balanced involvement of women and men in subsequent implementation. Although some studies, for example, in Guinea Bissau (Ploeg, 1979), Morocco (Davis et al., 1993), Tanzania (Tanzania, 1982) and Ethiopia (Poluha, 1980) have led to more participatory and gender-conscious projects, numerous examples exist of projects which have completely or largely excluded women. Therefore, a 'total approach', integrating both men and women in the whole project process, has been recommended (Wijk, 1985).

In institutional arrangements for women, and later for gender, the trend has been to establish separate units, bureaux or focal points (Wijk, 1985). These have often been marginalized from the main work of their agencies and have too many tasks, low budgets and no executive responsibilities (Hannan, 1995; Wakeman et al., 1996). Jahan (1995) found that structures by themselves made little difference. 'The critical factors appear not to be structure, but the definition of missions, resources, commitment and accountability measures to ensure agency compliance' (Jahan, in Wakeman et al., 1996: 41-42). Murthy (1993) mentions the emergence in India of gender networks, inter-agency workshops and, on a modest scale, overall organizational and human development. Gender expertise is valid, but only when vested in a sufficient number of qualified persons, strategically placed, with a clear mandate and recognition and able to influence operational decisions.

7.3.4 Learning projects, monitoring and evaluation

Pilots projects, experiments, action research and identification and analysis of 'best practices' have been valuable in developing strategies for gender-conscious community-managed water supply, sanitation and hygiene systems (Bakhteari and Wegelin, 1992; Goss and Thomas, 1996; Kurup et al., 1996; Kwaule, 1985, 1994; Mauluka, 1981; Narayan, 1989; Sharma, 1989; Sida, 1997; Sumbung, 1990; Tanzania, 1983). In Malawi action research led to the establishment of community demand management with a clear gender focus (Box 7). Having developed effective gender strategies, the challenge is to go

to scale. Pilot projects are usually marked by a high concentration of specialized, highly qualified national and international staff. They are likely have a separate institutional set-up and generous and autonomous budgets (Narayan, 1990). As such they do not represent the normal working situation (Galvis et al., 1996). In the demonstration stage, the scale of implementation increases. Regular staff have the major roles, and financing and administration are to a larger extent part of the national system. After demonstration, full-scale implementation ideally follows.

Box 7. Action learning on gender and water supply in Malawi

In the communal water point programme in Malawi, low-income urban neighbourhoods manage water demand in their areas. The programme started with a learning-by-doing phase. This phase revealed that male-dominated committees did not manage the neighbourhood-run and financed systems well. Male committee members had many other interests and high mobility, so they rarely met and consulted with water user group members. This also reflected negatively on operating hours and financial management. To reduce non accounted-for water, standposts were locked during non-peak hours, and male committee members were not always around to unlock the taps. Rate collection was not regular and funds not properly accounted for. Several interventions resulted in a more balanced composition of management organizations. This resulted in much better environmental sanitation and operational and financial management. But it also increased women's work burden. They did the work, but did not always make the decisions. The withdrawal of men also reduced sustainability. Hence the project has developed guidance to ensure the participation of men (Kwaule, 1994). As the utility found the approach had positive results for demand management it has expanded the programme from the capital to the other towns in the country.

However, in scaling-up the learning approach does not stop. In the process of going to scale, new problems arise at a higher and more political and institutional level. Galvis and others (1996) recommend holistic learning projects as a good way for sector professionals from different institutions (NGOs, universities, government) to solve new problems and build new capacities as part of regular programmes with regular staff. In their description of learning projects they do not, however, go below the community level and distinguish factors of gender and class.

Internal monitoring and evaluations can reveal gender imbalances and bring counter action, provided such aspects are included in the design (Hannan, 1990). In Togo, male and female field staff, through quarterly monitoring and planning meetings, discovered that women were under-represented in decision making (Pillsbury et al., 1988). In Indonesia, participatory evaluation of participation and gender in decision making was by means of pocket voting. Issues assessed concerned decision making in seven aspects of a water project: decision making in water user groups; selection of group leaders; location of facilities; decisions on group work; decisions on payments; need for sanctions and decisions on repairs (Narayan, 1989). The scores shows that the villagers took the decisions in 76 percent of the cases, but that field staff still decided in almost a quarter of the cases. Whether this was because of a paternalistic attitude, or to protect the interests

of the weaker sections has not been reported. Common men and women hardly decided (6 percent and 9 percent respectively), but male and female leaders had equal influence (21 percent each) and almost as many decisions (19 percent) were made by consensus of male and female group members.

7.3.5 Rewards

Assuming that policies, rules, procedures, training and tools are all in place, will working in a participatory and gender-sensitive way make a difference to a person's recognition and career? Tschannerl already wrote in the 1970s that, as long as engineers see their achievements measured in terms of efficiency and not effectiveness, motivation for a different way of working with people will be limited to those few who are committed to overall development goals.

Working in a different way with men and women in communities for better-sustained and used services and an enhanced autonomy in development also demands organizational change. Executive staff cannot change when higher level management does not approve of the new approaches and sanction new strategies. Working in a different way with people asks not only for training and guidelines. It also needs job and task descriptions adjusted to reflect interdisciplinary teamwork, participation and gender. Adjustment becomes easier when the working climate and arrangements are stimulating and staff who use participatory and gender conscious methods and help produce effectively performing and used facilities are recognized and rewarded. One or two measures can achieve little change; the effect comes from a combination of a variety of measures in human and organizational development (Interagency Task Force, 1983; Murthy, 1993; Narayan, 1990; OECD/DAC, undated).

7.3.6 The challenge: human and organizational change

Gender differentiation in the operationalization of water management principles and the promotion of health and hygiene is a condition for functional as well as developmental results. The challenge is to identify the set of human and organizational development factors that enhance the embracing of a gender strategy as a natural and indissoluble part of all interventions.

Epilogue

The predecessor of this book, *Participation of women in water supply and sanitation: roles and realities* was published in 1985. What has happened in the years thereafter? Perhaps the most noticeable development is that active participation of women in water supply and sanitation projects is no longer an exception. In almost all developing countries, women are increasingly involved in the planning, maintenance and management of the local water supply services and take part in improving local sanitation and hygiene. Their participation is not only physical, as voluntary labour in construction, maintenance and preservation of hygiene. Increasingly, particular emphasis is placed on their participation in planning and decision making and in professional maintenance and management of the facilities and service. Women also increasingly get access to capacity building for such tasks, along with the men.

So far, women's and men's participation in decision making has been mainly in the smaller and localised aspects: the design and location of facilities; the choice of caretakers and members of management organizations. As yet, very few projects and programmes give users both women and men, an informed choice in the larger decisions, such as the kind of technologies and service levels and the local systems of financing, maintenance and management. Yet it is the women and men who, through their contributions in cash, kind and work, will keep these services operational; so here, more informed decision making can be expected in the future.

Through the experiences and studies on women's participation much has been learned about the constraints to this participation and how these can be dealt with. It is now known that, with the right attitudes, skills and techniques, the practical constraints to the participation of women can be overcome, even when no extra funding, time and manpower can be made available. The projects and programmes which still state that, within a given culture, women cannot participate in the planning and management of water supply and sanitation facilities, do so in the face of much contradictory evidence, and use such statements as an excuse for a lack of appreciation, will and creativity.

The reasons why projects and programmes increasingly pursue the active participation of both male and female users in the planning and management of the systems are the direct benefits of high quality participation: more reliable service performance, general and hygienic use of facilities, better financial and other support. The resulting water supply, sanitation and hygiene improvements also meet the practical interests of the men, and especially the women in the communities, and so are a good step forward. Projects and programmes show much less interest in the strategic benefits of their investments, such as the capacities which men and women develop for managing their own development and the strengthening of their economic and social positions. From empirical evidence we know that projects and programmes can also produce such larger development benefits. For example, men and women, boys and girls can improve their education and training as

result of the programmes, and having more time, water and service-related work brings new economic opportunities for women and men.

But there are also many situations where such social and economic benefits are threatened, for example, where the burden of keeping facilities operational and in good hygienic condition rests more on the women than on the men, or where a small group controls the benefits of the services and use them for their own interests. Such situations endanger both the longer-term sustainability of the systems and the wider socio-economic development to which these systems contribute.

Gender and class differences in interests and power underlie many disbalances in work, control and benefits. If water supply and sanitation services are to remain sustainable, be equitable and contribute to broader development, projects and programmes must pay attention to such differences. However, while attention to the participation of women has become quite common, attention to their participation in relation to that of men has not. Even less common within this gender analysis, is giving attention to poor as well as wealthy women and men and to the different positions of women within their families. Where a gender analysis is present, attention has been directed particularly to the situation of women and far less to that of men. More attention to differences in social positions and class, and a greater focus on also men, will strengthen overall gender analysis in the water sector.

Within the sector, gender analysis and approaches are found most frequently in relation to drinking water supply projects and programmes. In the last few years, data have become available on who does certain physical and managerial tasks and with what effects for the services, the community, the households and the participants. Considerable evidence is available that effective management requires contributions from both women and men. Within this division, women perform particularly well in the maintenance, repairs and financial management of facilities which they in particular, use and benefit from. There is, however, a considerable risk that, just because women benefit, they are ready to work voluntarily when they cannot really afford to do so. This has negative impacts for themselves, their families and, in the long run, the community, the society and the service. There is also a need to look more closely at how service financing and direct and indirect service benefits are divided within households. There are indications that such divisions do not always reflect the different payment capacities within households and so hamper optimal socio-economic development.

In the last few years, a considerable number of communities in a large number of countries have been managing decentralized water supply services with the participation of both women and men for two years or more. The time is thus opportune to assess more globally what difference this makes for the sustainability of the service and for the men and women and their families. Earlier studies of this kind have been carried out in community-managed water supplies, but without attention to gender. Or they were based on desk research and paid attention to women, not gender.

While a gender analysis and approaches are emerging in drinking water supplies, this is hardly yet found in environmental sanitation and hygiene programmes. Almost everywhere, environmental sanitation conditions lag far behind progress in domestic water supply. One reason for this may well be the difference in demand for better sanitation between women and men. While women are greatly inconvenienced by poor sanitation facilities, and thus highly motivated to undertake improvements, payment generally has to come from the men. In the coming years, catching up with sanitation is one of the bigger challenges for the sector. The increase in low-income households in the cities, with low payment capacities and a high demand, and the high risks in environmental pollution and public health, also demand new approaches. A gender approach will be a strong help, as demonstrated by a number of pioneer programmes. It has been found particularly effective in raising and responding to differences in socio-cultural and economic demand for improved sanitation. Furthermore, the employment of female masons has helped to install facilities in homes and compounds where male workers are culturally less acceptable. A gender approach has also been instrumental in ensuring adequate maintenance and hygienic use of the facilities. It has stimulated the sharing of responsibilities for the preservation of hygiene and the education of young children on sanitation, in which not only mothers, but also brothers, sisters and fathers have been involved.

Whereas in the past women have tended to be excluded from improved water supply and sanitation programmes, men have seldom taken part in health and hygiene education. The great majority of these programmes focus exclusively on women and girls. Thus women's work tends to be increased, while men's roles and responsibilities are bypassed. There is an urgent need to look more closely into the responsibilities, work and attitudes of men regarding hygiene and hygiene improvements, also within the households, and to develop hygiene programmes with a better balance between roles of women and men.

A prominent development in the years since 1985 concerns the environmental context of the water supply and sanitation sector. Water supply and sanitation services do not stand on their own, but are influenced by, and have influence on, the overall land and water use conditions within which they function. Increasingly, these conditions are under pressure. The same land and water has to be used for different purposes, each with its own stakeholders and stakeholders' interests. As was originally the case with the participation of women, and then with gender, in the domestic water sector, the gender aspects of this development are the concern of a group that is still small in size, and the number of field studies and projects is modest. However, with the growing demand for, and impacts on, one and the same resource, and its confined and vulnerable nature, it can be expected that this expertise will rapidly grow in size and networking. Also the amount of data on water resources management in all its aspects, including gender, will increase.

In the years to come, specific gender expertise will remain necessary in both the water supply and sanitation sector and the overall water resources sector, for investigation, documentation and information and the development of human and organizational

capacities. At the same time, gender analysis and approaches will gradually have to become an institutionalized part of all projects and programmes, as was initially the case with community participation and then with participation of women. It may be considered that this stage is getting nearer when all project and programme staff in their dealings with water supply, sanitation and hygiene will automatically consider the following questions, while also looking at class, age and ethnic or religious group:

- Who has the information, men, women or both?
- Who does the work, men, women or both?
- Who makes the decisions, men or women or both?
- Who gets the benefits - water, training, jobs -, men, women or both?
- Who controls the benefits - service, income, training - men, women or both?

IRC Publications

IRC's Technical Paper Series cover a wide range of subjects. The series integrates technical and non-technical issues, such as operation and maintenance and community management of water supply and sanitation services. Prepared jointly by IRC staff and consultants, these publications are written for those working in the community water supply and sanitation sector.

Ongoing work at IRC and related organizations is presented in the Occasional Paper Series. Project and Programme Papers comprise studies, field reports, evaluations and other documents emanating from projects or programmes in which IRC or its partners have been involved. Both series contain useful information of interest to a limited target audience. The Training Series provides practical information and knowledge for use in training of various target groups. The Reference Series includes directories, inventories, a thesaurus, glossaries and other information tools in support of technical information exchange for community water supply and sanitation. These publications are designed to assist both documentalists and technical staff with information collection, storage, retrieval and use.

Titles of related interest published by IRC include:

Gender in Community Water Supply, Sanitation and Water Resources Protection : a guide to methods and techniques. Prepared by Christine van Wijk
(OP 23-E) 52 pages 1995

Together for Water and Sanitation : tools to apply a gender approach. The Asian experience. Edited by Eveline Bolt
(OP 24-E) 107 pages 1994

Working with Women and Men on Water and Sanitation : an African field guide
(OP 25-E) 98 pages 1993

The Community-Managed Sanitation Programme in Kerala : learning from experience. Prepared by Balachandra Kurup
(PP 4-E) 90 pages 1996

ISBN-90-6687-027-3

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