

**METHODS TO INVOLVE WOMEN IN RURAL WATER SUPPLY,
SANITATION AND WATER RESOURCE PROTECTION**



BACKGROUND DOCUMENT

IRC WATER AND SANITATION CENTRE

The Hague, The Netherlands

September 1992

202.1 92 ME
10138

**Acknowledgement for cover illustration:
Marie Thérèse Feuerstein,
Partners in Evaluation,
Mc Millan 1986**

LIST OF CONTENTS

LIBRARY
INTERNATIONAL REFERENCE CENTRE
FOR COMMUNITY WATER SUPPLY AND
SANITATION (IRC)

1. Introduction	1
2. Identification and preparation of projects	1
2.1 Felt needs, priorities and economic demands of men and women	2
2.2 Gender-specific assessment of health, socio-economic and environmental aspects	3
2.3 Baseline on women's living conditions	6
2.4 Formulation of gender-specific project objectives and strategies	7
3. Women's involvement and gender issues in local planning and implementation	8
3.1 Choice of technology, service levels and design	8
3.2 Arrangements for local maintenance and construction	11
3.3 Roles of men and women in community management and financing systems	12
3.4 Hygiene education and hygiene improvements	13
3.5 Protection of water resources and improvement of ecological conditions	14
3.6 Optimising project benefits for women	15
3.7 Community-based monitoring systems	17
4. Project monitoring, reporting and evaluation	18
4.1 Monitoring and reporting of project progress	18
4.1 Gender-specific assessment of sustained functioning use and hygiene	19
4.3 Measuring the impact of the project on men and women	19
5. Methods and tools	21
5.1 Getting support for women's involvement	21
5.2 Making information accessible to women	22
5.3 Organizing community meetings	22
5.4 Collecting gender-specific data	23
5.5 Strengthening or forming local management structures	24
5.6 Setting up local financing systems	26
5.7 Training of women functionaries	27
5.8 Participatory techniques for project personnel	28
6. Water supply, environmental sanitation and water resource protection: conclusions on gender dimensions	29

LIBRARY, INTERNATIONAL REFERENCE
CENTRE FOR COMMUNITY WATER SUPPLY
AND SANITATION (IRC)
P.O. Box 93190, 2300 AD The Hague
Tel. (070) 814911 ext 141/142
RBN 10138
LO: 202.1 92ME

1. INTRODUCTION

This literature review covers the main activities and decisions in rural water supply, sanitation and water resource protection projects, which according to the experiences collected by the International Water and Sanitation Centre IRC, require either a gender-specific approach or specific measures to bring women into the projects. The insights summarized in this document will be one of the inputs for three Regional Expert Consultations on Methods to Involve Women in Rural Water Supply, Sanitation and Water Resource Protection Projects. The other inputs will be the knowledge and experiences of female staff dealing with community participation and involvement of women in this kind of projects.

The consultations will be held in Nairobi, Kenya (February 1993), Cali, Colombia (July 1993) and Goa, India (September 1993). Each consultation will be attended by 10 female and preferably national project staff from DGIS-supported rural water supply, sanitation and environmental protection projects, 1 female staff member from the International Water and Sanitation Centre (IRC) and 1 moderator or resource person from a local organization hosting the consultation.

The purpose of the consultations is to exchange experiences on gender-specific approaches in the participants' projects and to document these experiences in a guide-type document on how to apply a gender-specific approach when dealing with rural water supply, sanitation and water resource protection.

The reason for the production of the guide is that there is not yet any practical document on women's involvement which deals with the whole project cycle and which is based on the growing store of field experience. Existing documents are either general literature studies and reference documents, or training guides which are meant for high-level officials and project managers, not for field use, or which focus on participatory methods and techniques for project implementation, whereby gender is one topic in a much wider range. Target groups for the guide will be the participants' own implementation projects as well as other water supply and sanitation projects in the three geographic regions, and educational institutes in the projects' areas where future field staff get their training.

2. IDENTIFICATION AND PREPARATION OF PROJECTS

In the identification and preparation of rural water supply and sanitation projects, a gender-based approach has been found necessary in at least the following aspects:

- the identification of the felt needs and priorities of men and women for the project;
- the gender-specific assessment of health, socio-economic and environmental aspects;
- a baseline on women's living conditions and possible impact of the project on women;
- the formulation of gender-specific project objectives and strategies.

2.1 Felt needs, priorities and economic demands of men and women

A prime condition for a successful village water supply or sanitation project is that the people feel a need for the project and give it a high priority on the list of activities and services they will support in their village. Needs and priorities of men and women are often not the same, while motivation and resources to sustain improved WS&S facilities may also differ. In addition, such needs and priorities may vary with the economic status of the families concerned, family composition (e.g. number of females, female head of household), religious and ethnic affiliation, etc.

As a result, economic demand for the proposed facilities and willingness to contribute to them can also vary considerably. The demand for an improved drinking water supply and/or better environmental sanitation is usually higher among women than among men, as shown by women's higher willingness to contribute when this aspect is investigated separately for both. Whether they are also able to meet these demands depends very much on the resources and decision making patterns within the households and the kind of options offered.

Where couples make a joint decisions, chances of adoption are generally greater when the improvement has merits (though not necessarily the same) for both, e.g. status and safety for wife and daughters for the men, more privacy and convenience for the women.

Where male heads of households make the decisions, special information is often needed to convince them that a nearer water supply or better sanitation is not a luxury, which "makes women and children idle", but an improvement which benefits the whole household in various ways. Moreover, a special strategy is needed in those situations to inform also the women, since otherwise they tend not to be aware of the project and can thus not informally approach their husbands about participating in the project.

Moreover, there are always villages and groups, e.g. female heads of households, which are less able to contribute, and therefore often have less access to improved facilities for water supply, sanitation or hygiene, especially when the project does not include a range of choices, such as shared facilities or cheap, yet attractive and functional models.

In some areas, women further have their own sources of income, but when men and women have to contribute an equal share, the contribution of the women usually represents a higher percentage of their income or time than that of the men.

A full picture of village conditions and views thus requires an assessment with men and women from all main socio-economic categories.

Means for assessment

Projects have different ways to ensure that its activities are carried out in communities with a sufficient support and demand. In many projects, the authorities use data on existing conditions to select priority project areas or villages, such as a shortage of water or a high incidence of W/S-related diseases. Research has shown that such general indicators, while useful as a first step, do not necessarily tally with how the users themselves see the situation.

In some project identifications, socio-economic studies are used to compare the project's views with the perceptions of men and women of different cultural and socio-economic

backgrounds in the villages themselves. Thus it is assessed whether the various types of users see water, environmental sanitation or water resource protection as an urgent problem and what views they have on the type of facilities and their maintenance, management and financing. In the past, this type of study was usually a large, formal and relatively costly socio-economic survey, but presently more informal and participatory types of appraisals are increasingly used.

When carried out well, these studies will make separate reviews of the experiences and views of men and women and give a gender-specific report of the results. On the basis of these studies, revised village selection criteria or lists of priority villages may be drawn up and inputs given into selecting a first range of technically and socio-economically suitable technologies.

Yet other programmes rely on a request from village authorities, or make a preliminary allocation themselves and then check whether a genuine demand for the project exists in the village(s) concerned.

Special tools used to gauge the interest of men and women in the project during the project's identification and preparation phases include:

- obtaining information on felt needs and priorities from village leaders and organizing separate meetings for men and women for getting their views (for organizing village meetings, see section 5.3);
- home visits in preliminary project villages, whereby project staff or selected villagers (teachers, informal village leaders, earlier women adopters) gauge the interest of the households (for gender-specific interviews, see section 5.5);
- a comparative survey (quantitative or qualitative) in the whole project area, to list villages with priority needs and inventorize male and female views in the different socio-economic strata;
- a general needs assessment, in which improved water supply and sanitation are rated against desired improvements in other sectors;
- presenting the tentative project in a general village meeting attended by men and women from all user categories and getting their feedback. A drawback is that negative views are not easily expressed in such meetings and women often do not attend and/or speak out, although special measures can improve this. (For organizing village meetings with men and women, see section 5.3);
- bidding games as part of more general investigations to assess what men and women will contribute financially (payment water rates, latrine contributions).

Irrespective of the methods used, it seems essential that the views of men and women in the different socio-economic and cultural categories of the area are asked when selecting project priority areas and determining the socio-economical and cultural aspects that have to be taking into account in the general preparation of the project.

2.2 Gender-specific assessment of health, socio-economic and environmental aspects

Most rural water supply or sanitation projects have as aim the improvement of the health and/or well-being of the rural population. In this context, the special position of women (water collectors and managers, health providers) is usually mentioned.

Carrying out gender-specific assessments of health, socio-economic and environmental aspects can be a useful tool to maximize the long-term benefits of the projects and to prevent any negative ecological impacts on water resources and the environment.

With regard to these benefits, considerable differences may exist between what the projects themselves aim at and what local men and women would like to get from them.

Health benefits

For many projects, improving people's health is the main aim, through a better local water supply, more water use and better hygiene conditions and practices. Planning the required technical interventions and hygiene education activities for such changes is easier when local water use and hygiene conditions and practices are identified and the people can explain the reasons for particular situations or habits. Often, such reasons are sensible from the perspective of the local users.

Because of their different tasks and responsibilities, men and women tend to have different knowledge and expertise in this subject area. On preferences for water sources, management of water and waste and channels of health information, for example, women are the more obvious partners, while the men may have to be approached when discussing the financing or labour implications of a new well or a family latrine.

Socio-economic benefits

For many of the users, social or economic reasons are often a more important reason to support a project than health: a greater convenience, more privacy or safety for women and children, a higher status, time savings or easier time management from a closer and reliable water supply, nearer latrines and/or access to more water, economic uses of time, water or waste, opportunities for income-earning as local producers and latrine builders in e.g. Mozambique, Kerala, Polynesia, well chlorinators in Kerala.

Projects may also have undesirable social or economic consequences, such as a reduction of meeting possibilities for women in areas where their mobility is already restricted, or loss of work for poor women or men, e.g. when jobs in water collection or waste disposal become redundant with the introduction of a new technology. Knowing what local men and women expect or fear from a project will be of value not only to promote the project, but also to plan better for the expected benefits.

Environmental impacts

A third impact to take into account when planning a W/S project is on the environment. These impacts can be two-fold: the water supply or sanitation projects can have negative and often not previously realized impacts on the environment, and ecological degradation can reduce the quantity and quality of drinking water resources and makes traditional ways of dealing with various types of waste no longer adequate.

Examples of water and sanitation projects which have caused new environmental problems are private connections or public standpipes with insufficient drainage, causing stagnant pools and wet conditions favourable to hookworm and insect breeding; new settlement and landuse when catchment areas are opened up and human practices pollute the source, and erosion from overgrazing at waterpoints in cattle areas.

The opposite situation occurs when environmental degradation reduces the availability and quality of drinking water resources. Indiscriminate exploitation of forest and mining industries have caused natural water sources, such as mountain rivers, to go dry or become heavily loaded with silt or chemicals. In other cases, agricultural irrigation has lowered the groundwater table, causing wells for domestic use to fall dry, or become silted in coastal areas. Increasing pressure for land, bringing people to settle in or use

catchment areas and causing bacteriological contamination of streams used for drinking water by lower-lying villages is another frequent problem.

Deforestation, and its negative effect on water sources can be aggravated by the need of women to collect wood as household fuel, but the impact of this activity is very limited when compared with commercial activities. More typically, women are the greatest victims of environmental degradation, because of the above-mentioned effect on the availability and quality of drinking water sources and the increase in their work of collecting water and fuel.

To counteract the negative impacts of macro-economic activities on their lives, women in some countries have started to organize themselves in protest or action movements, such as Chipko in India and the Green Belt Movement in Kenya. In other areas, projects strive to limit negative impacts for women by combining or linking the improvement of water supplies with efforts to reduce ecological degradation and enhance the economic base of poor women. Stove projects in Kenya and Burkina Faso, for example, have reduced wood consumption and collection time by 33% and 2.5-5 hours/week respectively and provided female stove builders with an income. Tree nurseries, often located near the improved water source, and afforestation projects are sometimes also a source of income for poor villagers.

Means for assessment

To assess local hygiene conditions and practices as well as more economic uses of water, various methods can be used. Women and men can for example be asked in separate meetings or through surveys about their patterns of water use and sanitation in the wet and dry season and the reasons underlying these patterns. Specific tools exist to make these discussions more participatory and bring in an element of problem-solving (see Section 5.7). Another form of participatory assessment is to make an environmental walk or do a simple village survey with a group of male and female representatives.

Also useful is to find out what hygiene education already exists, including informal learning systems among women) and what the constraints are of the existing programmes, e.g. frequency, access, target groups, methods, applicability, participation and influence of villagers on the program.

It is further important to check traditional systems to maintain water sources or waste collection and find out how they are organized between men and women.

Results of local fact findings can be presented in a village meeting and the reactions of the villagers asked regarding correctness, completeness, possible action, etc. Section 5.3 gives details on organizing a meeting in which both men and women take part.

Economic use of water or waste requires a specialistic assessment. Apart from a felt need or interest, there must be enough and sufficiently reliable extra water and time to allow economic use, access to other resources and inputs (land or capital/ credit, materials and equipment, training, marketing), a good market and price for the produce and the producers must have control over the resulting income.

Where conditions are favourable and good inputs are given, it is beneficial for the women, their families and the project to link water or sanitation projects to an income generation project. Reasons are that the latter improves the socio-economic status and self-respect of the women and they use the income for e.g. better hygiene and living conditions for their families (soap, utensils, housing improvements, water connections).

For the assessment of environmental impacts, it will be important to look at what factors can affect the reliability and quality of the water resources, such as land and water use, soil conditions, drainage and deforestation, and what can be done to prevent/reduce these problems. Purposive sampling techniques can help to ensure a gender perspective, e.g. identifying both male and female farmers with different socio-economic backgrounds and having separate interviews with each group.

A second area for attention is the avoidance of the creation of new environmental hazards: stagnant water at taps, soiled latrines, especially in schools and other places where many are gathered, drains blocked from lack of maintenance, uncollected solid waste, etc.. This usually requires a combination of good solutions, a good design, early consultation of women (who are the main users and managers) on the appropriateness of the intended systems, and planning with the villagers of gender-appropriate upkeep. More on the latter (appropriate design and maintenance) can be found in sections 3.1 and 3.2.

2.3 Baseline on women's living conditions

The improvement of rural living conditions is a major aim of rural water supply, sanitation and ecological projects. Women are always a major beneficiary group and sometimes, e.g. in social forestry, or latrine and stoves projects, they can also be the main producers. It has also been proved that involvement of women in local planning decisions and in management are among the conditions for successful projects, because women know local conditions well and have a large personal interest in good management of water and sanitation.

When reviewing the living conditions in the project area during the preparation phase, it is thus important to include a qualitative and, where data are already available or easy to obtain, a quantitative profile of women's work, position and influence, including in water supply and hygiene, and their possibilities to participate in the project.

A baseline establishes a database which helps planning for women's involvement and, when so designed, can allow later measurement of positive and negative impacts of the project on women's conditions, such as work, knowledge, skills, organization, self-respect, income and control over living conditions and earnings.

Projects which later want to evaluate the impact of the facilities on women's workload, or on hygiene conditions and practices of men, women and children, should do a so-called time budget study or a baseline study on local water use and hygiene patterns.

Means for assessment

With regard to general conditions, such as income, literacy, health, water supply and sanitation conditions, qualitative and quantitative data will often already exist (other studies, area statistics, WID reports, etc.). These are likely to be of a general nature and may require supplementation by more local and subject-specific data.

The collection of this data does not necessarily require a quantitative study: information from key informants and/or group interviews with a cross-section of the target population can often provide a good picture of women's positions and the constraints to be overcome in involving them in project decision-making. There is also a growing range of participatory techniques for helping men and women to establish their own baseline and through this process become more aware of local problems and begin a

dialogue on how these could be solved. The collection of large amounts of statistics, which are subsequently not used, should be avoided.

In specific cases (much previous time demands, good systems and also other requirements met, see 2.2), improved water supply or waste disposal can have substantial impacts on women's work and on village production. A more detailed study of work and time use patterns by women and men can lay the basis for future impact assessment in such cases, especially when a similar study is also done in one or two similar villages without project intervention (control villages).

2.4 Formulation of gender-specific project objectives and strategies

In many rural water supply and sanitation projects, the main objective is the construction of facilities. Most projects either specify the number of facilities ("install 400 handpumps, or construct 1000 latrines, in 4 years") or the number of villages or households ("serve 150 villages with improved water supply; install improved latrines in 50% of the households").

Although such objectives may reflect a women's interest, especially when men's and women's need for improvements have been established (see 2.1), the strong focus on numbers bypasses the principle that these facilities are not just to be installed, but that they can only serve a purpose when they are used and maintained. It is therefore valuable to add to any objective of construction "....in such a manner, that the facilities are used by (e.g.) 80% of the men, women and children, and that they are designed, maintained and managed in such a manner that no unhygienic conditions develop and/or users are not forced to return to unsafe provisions".

The prerequisite that facilities are used and maintained makes the involvement of women more necessary, because within the household they determine what water sources are used, they guide the children on water collection, waste disposal and hygiene and they look after the day-to-day maintenance of traditional water sources, kitchens and latrines.

Formulation of general participation strategies

General use is not possible without active involvement of the users, since facilities that were planned **for** and not **with** the users have often not been used. In addition, governments and communities increasingly need local maintenance and management systems. Without community participation in local maintenance and management, 40-50% of the facilities may later be out of order. A strategy for user involvement is therefore always required.

This strategy usually defines in what activities and decisions the users will be involved; what local organization(s) will represent the villagers in the project and be in charge of local project-related activities during project preparation, implementation and maintenance; how the villagers will take part in the formation of these organizations and what their composition, status and authority will be; what training will be given to the various village functionaries, and what support these will get. Also defined is who will carry out these activities and what their staffing, training and material requirements are.

The task of development and implementation of the strategy is generally given to an organization or department with experience in community involvement: the Department

of Social Services, Community Development Department or an NGO. Less commonly, a special social wing is created in the technical project agency (often financed temporarily by a donor), or a core team of social specialists is engaged to develop a strategy and train technical field staff in community involvement skills.

Making participation strategies gender-specific

Within this more general strategy, special attention to, or a special strategy for, women's involvement is required to take into account that men and women have different areas of responsibility and control and that, when left to chance, women will often not take part in the various project activities and decisions.

Basically, this strategy will define in what functions and organizations women will be represented, how they will be involved in decisions, and what special staff and training provisions will be made to secure their involvement, both during the project's implementation and afterwards (operation, maintenance, management). Provisions for training will include training for women, either exclusively or alongside men, to enhance women's capacities. A second type of training concerns women's involvement as an issue, to create more understanding and expertise on this subject among male and female project staff and among village leaders and to prevent feelings of exclusion or antagonism from male villagers when separate activities are organized with women.

3. WOMEN'S INVOLVEMENT AND GENDER ISSUES IN LOCAL PLANNING AND IMPLEMENTATION

When it has been decided that a particular water or sanitation project will be implemented in a certain area or villages, more detailed planning for implementation will take place in and with the communities concerned. Experience has learned that distinct attention to men's and women's roles is required in the following areas:

- ✓ choice of technology, service levels and designs
- ③ - arrangements for local maintenance and construction
- ④ - formation of local management bodies and the roles of men and women in local management and financing
- ⑤ - planning and implementation of village hygiene education programme and improvement of local hygiene conditions
- protection of water resources and ecological conditions
- optimization of project benefits for women
- establishment of community-managed monitoring systems.

3.1 Choice of technology, service levels and design

Basically, two types of projects for water supply and sanitation can be distinguished: pre-determined projects, in which the project makes the choices on technology and service level that a community or area will get, and projects whereby the community manages the local water supply, environmental sanitation programme or resource protection programme. In the latter, the user community usually has a greater choice and authority than in the former.

Participation in pre-determined projects

In pre-determined projects, the choice of technologies and service levels has already been made during the preparation stage of the project. In the past, this choice was often based on technical and economic (cost) criteria only. Now, also socio-economic and cultural criteria are generally taken into account, and the views of the future users are investigated as part of the decision-making process. In Chapter 2 it was already discussed how important it is that during these preparations a cross section of men and women is consulted when surveys, meetings, etc. are held and that their views are recorded and analysed separately and are reflected in subsequent plans.

Where a general technology choice has already been made, e.g. a piped gravity supply or handpumps for water, or a particular type of latrine, the community will usually be involved in the more detailed and local planning decisions. Typically, such decisions include:

For water projects:

- whether the particular village wants to participate in the project;
- whether the proposed technology (e.g. handpumps) and service level (e.g. 1 pump per 250 people) is acceptable;
- whether the users agree to the required community contributions in cash and kind (e.g. labour);
- whether the general design (e.g. water source, intake, transmission line, storage tank, distribution net in case of a piped system or type of well/pump in a handpump project) is acceptable and optimal from a socio-cultural and economic point of view (cultural acceptance of sites/tracks, rights of access, most economic route, maximal number of households covered, etc.);
- what actions the village undertakes to protect the source/groundwater/catchment area;
- where public tanks, taps, pumps, etc. will be located;
- whether the type and design of the water collection points is appropriate (lay-out, ease of operation and cleaning, privacy, safety, etc.);
- whether additional provisions (e.g. for clothes washing, bathing, cattle watering, vegetable gardens) are required and if yes: what will be their details on design, location, costs and cost financing, maintenance, management, use;
- the technical advice/training villagers can get after the facilities have been installed;
- whether the maintenance and maintenance cost/financing implications are understood and accepted;
- whether the health/hygiene implications are understood;
- ① - the time schedule for implementation, including for the community contributions.

For sanitation projects:

- whether the particular village wants to participate in the project
- what sanitary improvements are wanted most (waste water disposal/hygiene at public taps, school/household latrines, solid waste disposal, smokeless stoves, etc.)
- what the village and beneficiaries will contribute;
- whether the design of the facilities is socio-economically and culturally acceptable;
- the involvement of the users (men, women) in adapting the design of the facilities and who will pay the extra costs of an above-standard design;
- the involvement of the users and managers (women) in selecting the location of the user facilities;
- the technical advice/training the villagers can get;
- the maintenance, incl. sometimes costs and financing;
- the health/hygiene implications;
- the monitoring of (ongoing) installation and hygienic use.

Information for users' decisions

Information on the project and for local decisions is usually given by means of meetings. It is very important that these meetings have an open character and also women participate in them, either together with men or in separate women's meetings. How to reach women with information about these meetings and how to help them attend and speak out is discussed in detail in section 5.2 and 5.3.

When other means of communication (booklets, posters, mass media) are used, it should be made sure that these are accessible and understandable for women as well as men. Illustrations should be pre-tested and depict both men and women. This may include women in new roles, e.g. repairing a pump, in bookkeeping or as latrine masons, as these are some of the ways in which women's involvement has made projects more successful.

Care should however be taken to link such illustrations up with the required inputs, such as information to male leaders and husbands, and to the women themselves ('why women mechanics') and that the materials are only used when provisions to implement the illustrations are available (e.g. training, see 5.6).

Choosing locations for facilities

Location of public or shared facilities is often done by a representative group of male and female villagers, e.g. a group of respected formal and informal leaders, an existing and representative village body or a specially elected water or sanitation committee. It is important that both social criteria and technical criteria are used. Social criteria can be, for example, general and easy access, central location, fair distribution, good safety to women and children, sufficient privacy. Technical criteria may include good drainage opportunities, elevation or groundwater availability and quality.

Inserting a peg in preliminary selected sites, making a preliminary map, or otherwise announcing selections and asking feedback in a meeting or otherwise is sometimes used to cross-check acceptability of selected locations.

Design features

For designs of latrines, standposts, cattle troughs and bathing and laundry facilities, small-scale models, e.g. from papier maché, clay or cardboard have been used to get users' views on appropriateness of design and to invite suggestions for improvements.

Evaluation of prototypes or of initial designs in the first project villages and visits to neighbouring projects have also been used to get valid user feedback. Experience has shown that it is essential that not only male leaders participate in such evaluations, but also women users.

Extra provisions

Extra facilities or design adaptations are usually wanted free of charge. These may raise the costs and leave less funds to serve others with no facilities at all. Negotiations about partial or full user payment of any above-standard costs are therefore advisable and are generally well-accepted.

Community contributions

In planning user contributions to construction, the division of labour and the time calendar for men and women will be of relevance. In some cultures, certain types of work are done by men and others by women. Women and men may also have different

duties/crops with different times and amounts of labour requirements. This can affect the availability of labour.

Where a cash contribution per adult is required, it will be important to check how this is financed: from the general income, or from the separate (and usually different) incomes of women and men. Care will also be needed to avoid that women take part in or do the majority of the physical labour, but have no part (leadership roles) in the planning and management decisions and in quality control.

Longer-term implications

Very important in the planning stage is further that both men and women have a clear idea of the longer-term implications of a particular technology. This may include both benefits (more time/energy for other family activities/community development work/school or adult education; increased safety, increased family/community status, more/safer water, better family hygiene/health) and behavioral consequences (regular preventive maintenance, timely repair, no use/return to unsafe sources, preservation of hygiene, regular cost contributions, good management). Usually, the latter implies that both men and women have to contribute.

Planning decisions for community-managed services

Under recent developments, villages are increasingly asked to take on the day-to-day maintenance, management and financing tasks of improved village water supplies and/or to manage local activities for environmental sanitation and hygiene education.

This approach implies that the villages should then also get a greater, and more informed say in what they will manage and how they will do so. In other words, no more pre-determined technologies, but giving communities a range of options and explaining for each option its implications and benefits, such as convenience, health, ease of maintenance, costs and reliability. The communities can then choose on a more substantial basis what technology and service level they want and are able to sustain.

As both men and women will play a role in the use, maintenance and financing of these systems, information on these aspects must reach both men and women and both must have a say in the community's decision.

3.2 Arrangements for local maintenance and construction

A growing number of village water systems is maintained by the villages themselves. Construction and maintenance of sanitation facilities is also increasingly done by trained villagers. The planning of who should be recruited and trained for these tasks thus becomes more important. Decisions to be taken as part of the planning process include:

- provisions for maintaining hygiene at public waterpoints
- provisions for preventive maintenance of equipment
- provisions for repair of equipment
- provisions for construction of new facilities, such as additional waterpoints and latrines.

Field experiences show that in these decisions a gender approach is required. Without conscious consideration of how to divide tasks and authority, it often occurs that functions and training for maintenance of water systems or construction of latrines go automatically to men, while women are not considered, or do the day-to-day work in practice, but without training, recognition or compensation.

Issues for consideration are:

- Who are best suited to manage water collection sites and prevent misuse, e.g. by children, animals? Can women be given sufficient authority and support from others to effectively manage a water site? How to choose the right persons (influence, time, interest)? Training?
- What is the role of women, who daily visit waterpoints or guide children's visits, in a) preventing and b) recognizing, diagnosing and reporting technical problems? Do women need training for their role(s)?
- Are women traditionally involved in plastering, roofing, construction? Would they be interested to upgrade these skills? Is construction of some type of sanitation facilities a culturally more appropriate job for women, e.g. household latrines, smokeless stoves and other sanitation facilities which require entering the privacy of the home and communicating with especially women?
- Is it possible/advisable to train women for maintenance and repairs of water systems and/or construction of domestic sanitation facilities? Or does it not matter much, as long as women take part in the supervision and have means to influence the quality of construction and maintenance?
- If women are to be trained, what are the implications for the project and for the women? Could it make maintenance more expensive, e.g. because women are restricted in the distances they can travel? Could it bring women mechanics a double burden (work and family) against unrealistically low payment? Or a valued source of income and skills?

In general, experience is that women make excellent site managers and are also very good and conscientious in technical maintenance, especially in handpump projects, where the longest and greatest experience with female mechanics exists. Projects also exist which have effectively trained and employed or set up female latrine masons, e.g. in Lesotho, Mozambique and India.

It is however important to choose the right candidates and to adapt training and working conditions. Doing this in a joint decision-making process with a group of women is often helpful, resulting in suggestions on good candidates, peer support in taking up the job, offers for help at home when the candidate goes for training, etc.

3.3 Roles of men and women in community management and financing systems

When communities take part in a water or sanitation project and subsequently manage the resulting service or go on installing household latrines, they usually require an organization which organizes the community contributions, supervises and controls the work and manages and administers the resulting community service.

This organization can either be an existing village institution which is in charge of all local services, such as a village council or a village development committee (e.g. the juntas de accion comunal in Colombia). It can also be an already existing more specialistic village organization, such as the committee for health or social welfare or the mothers' club, or a specially created organization, such as a water committee or water board.

Disadvantages of existing general organizations such as councils are a lack of female members and a wide area of interest. It is therefore sometimes better to use an existing organization with a related mandate, when this organization functions well or can be strengthened, or alternatively, to organize a new one. In both cases, it is usually

necessary to undertake some special steps to include female members and to ensure that they are actively involved, and not just members on paper. In some cultures, women prefer to form separate committees and act as a kind of control and pressure groups. Methods how to involve women in management organizations/committees are listed in section 5.4.

Financing systems

Increasingly, villagers are asked to contribute to the operation and maintenance costs, and sometimes also capital costs, of improved water systems and to the installation costs of latrines and other sanitary provisions.

It has already been said that when equal amounts are asked from men and women (e.g. 20 shillings for every 'adult' or 'able-bodied person'), this equality can be spurious, if men and women each pay this amount from their own sources of income.

Time, place, nature (cash or kind) and frequency of payment can also be inconvenient for women. Monthly tariff payments can for example be a problem in areas where cash is available per day or only after the selling of the harvest. A checklist on the different payment options can help in choosing, together with the various village groupings, the locally most appropriate financing system for women and men.

In collecting and managing the funds, women play a very prominent role. Possible reasons are that women treasurers are most trustworthy and very motivated to keep a good domestic water supply or sanitation project operative, and that home visits from or to male rate collectors are less acceptable. However, most women treasurers want more and more realistic training on financing and financial management.

When women are involved as rate collectors, their workload should not increase without noticeable benefits. These benefits can include that the female collectors get status and/or some compensation in case of much work; that women as a whole get a better water service or sanitation; and that the women collectors and treasurers have insight in and control over the proper use of the collected funds (accountability). Details about tools for fund raising, rate collection, financial administration and accountability are given in section 5.6, training of women functionaries.

3.4 Hygiene education and hygiene improvements

The content of a hygiene education programme is often determined by project staff, who notice all kinds of hygiene problems which need to be changed. However, local men and women often differ in their hygiene priorities and thus in their willingness to use resources to remove these problems. Project staff may also overlook certain problems or see problems which the community does not see.

A first step for a more gender-specific hygiene education and hygiene improvement programme is thus to determine what men and women see as health/hygiene problems in their village and would like to change. This can be done using various participatory methods and tools. Examples are:

- A discussion with men and women about environmental/hygiene risks in their village using ready-made pictures of risky practices and conditions that are typical for the village or area, or simulating villagers to make up their own pictures, using a set of loose elements (an unprotected water source, a broken tap/handpump, a drinking

water storage vessel with communal cup, an unused latrine, a child defecating near a stream or school, etc.)

- An environmental walk with male and female village leaders to inventorize the various health risks;
- A participatory village survey (e.g. participatory rapid rural appraisal);
- A game (in several countries, games have been developed through which the players can identify village and household problems in environmental health).

Section 5.7 gives more details on the development and use of participatory methods and tools by project staff.

3.5 Protection of water resources and improvement of ecological conditions

Low-cost village water supply projects generally use two types of water sources: surface water, often a clear mountain stream, for gravity schemes and groundwater for handpumps. Lack of water resource protection and environmental degradation have a negative impact on water quality and quantity in both types of projects.

In gravity projects, the foremost problem is the deterioration of the quality of the water: muddiness (high siltload or turbidity) and bacteriological contamination. Deforestation and landuse in the catchment areas cause high soil erosion. Part of this soil is washed into the streams and makes them turbid, especially in the rainy season. Other common problems are a diminishing amount of water in the streams, when less water is retained in the soil and the area gradually dries up, and chemical contamination when a surplus of pesticides and fertilizers is washed into the source. Bacteriological contamination is caused mainly by increased human settlement in the catchment area.

Problems with the quantity and reliability of handpump water occur, when the water table goes down, because of overuse (e.g. for irrigation) or desertification. Water quality can be affected negatively when pit latrines are built too close near shallow wells or chemicals are used for agriculture or horticulture around a shallow well.

Problems of insufficient or turbid water affect especially women and may force them to walk to farther water sources or temporarily use other, less silted water, which may however be bacteriologically less safe.

Catchment areas for gravity schemes can be protected by avoiding erosion and settlement around water sources, planting of grass and trees, avoiding overgrazing and improving farming habits, such as terracing and contour ploughing. Groundwater will have to be protected by regulating water extraction and preventing pollution of the groundwater table.

Most of these measures require or can benefit from close cooperation with the people living in the area. Gravity supply projects in Guatemala and Tanzania have for example as a condition that villages have to plant trees in the catchment area before construction of the water supply will start. Other projects include village tree nurseries and transplanting the seedlings to the catchment area and on their farms, or tree nurseries and afforestation as income-generating projects for women.

Participation of the villagers covers both identification of local problems and solutions and their subsequent management. Two cases, one from Latin America and one from Asia can illustrate this. A water treatment plant in a Latin American village failed to

work properly when the load of cattle faeces in the source, a small mountain stream, became more than the plant could manage. The engineer wanted to fence the source or contain the cattle, but the villagers said barbed wire would get stolen and they had no grazing lands which they could fence or children who herded the cattle because they now went to school. However, the village organized all its men and planted prickly bushes at the source, which forced the cattle to graze and drink downstream. A similar problem, the silting up of lake Sukhna near Chandigarh, India, was contained when the people of the village at the head of the watershed took on the management of a checkdam, from which they could use the water for local irrigation. Part of the management was that the villagers controlled the overgrazing and erosion in the area so as not to fill up their dam.

Experience in water and soil management show that in this participation and management it is necessary to make a distinction between roles of and benefits to men and women. Different views on and resources for water resource protection, for example, may only become clear when the two groups are consulted separately. Landuse patterns may also vary with gender. A woman may for example be more dedicated in raising trees, yet not be able to plant the trees she has raised, because she has no say over the use of the family's land.

Gender differences also exist in knowledge and expertise on what species are most required to meet local needs (e.g. one species of trees for firewood, another for construction or fruit production) and which species are most suitable for local conditions. Eucalyptus trees for example, are often planted because of their fast growth, but women often dislike them as firewood, because the wood burns so quickly, or because they lower the water table, so that wells have gone dry.

Attention will also have to be paid to the division of the workload for catchment protection and ecological rehabilitation, to avoid that the greater part of its workload falls on the women, while benefits of their work go to all, or perhaps even only to a small elite.

Last, but not least, women should share in the management of all village water resources, to ensure that both men's and women's interests in the use of these sources are met and compromises are found in case of conflicting interests. In many areas where the same water has to be used for cattle or irrigation and for drinking, special water management arrangements will be required to protect the interest of each user group. The same applies to villages where new drinking water sources (taps, boreholes) are introduced next to already existing ones (wells, ponds). Where women, who are responsible for the domestic water, do not share in the control over all these sources, they usually pull at the shorter end of the stick and find no more or polluted water, soiled and inaccessible surroundings, and/or neglected and dried up traditional systems.

3.6 Optimising project benefits for women

Workload and convenience

One of the greatest benefits of domestic water supply and sanitation projects is that they can lighten the burden of the many women who struggle with getting enough water for the families' needs, keeping the house and the family's clothes clean and hygienic and preserving privacy and safety during acts of hygiene and sanitation. Easy access and operation; easier time management and more safety because water can be collected and latrines used as and when needed, even at night; ease of operation and cleaning; use of

more water, and the productive use of time gains are some of the benefits that profit not only the women themselves, but also their families. These benefits all are determined by the degree to which women are consulted on and can influence the design, and location and use of water supply and waste disposal facilities, as discussed in section 2.

Reliability

The reliability of a domestic water supply or sanitation service depends, apart from its technical appropriateness in design and its affordability for the particular users, on the degree to which those users, men *and* women, have control over the system's functioning. This implies that when a local organization runs the service, women will have to be represented in this organization and that these representatives are not just any females, but women who can stand up for the common interests of women in their community and are able to muster authority and respect.

Moreover, both with a locally-run service and in cases of an external agency, women should have an opportunity to influence operating hours and user regulations when restrictions on water use are required for technical, health or economic reasons.

An example of the former (restricted service) are cases where the water agency or local management committee rations the water by giving only a few hours' of supply per day (India, Egypt) or by locking up standposts outside peak hours (Malawi). When women are not informed and cannot participate in decisions on the distribution system, domestic management becomes very difficult and they have to send young children to wait until water comes.

An example of the latter (regulations on use) is the ban on washing near wells and taps, for fear of water contamination and unhygienic conditions. Such regulations have forced women and children to continue to use bilharzia infested water sources for clothes washing and bathing, because the alternative, collecting all water from the pump or tap and carrying it home is much more time consuming and labour intensive than bringing one's washing and children down to the source, especially when distances are long or a steep slope has to be negotiated.

Finally, reliability of the service is affected by the quality of operation and maintenance arrangements and their supervision (on which women may have an influence, as discussed in section 3.2) and by the degree to which the management organization is accountable for its service to the rate payers. Especially when other means of influencing a quality of a service are absent, non-payment is often the only way users have for expressing dissatisfaction. When users get a say, e.g. when the system's operator is also made accountable to a village organization or through annual user assemblies, the service will often improve.

Social benefits

Social benefits are enhanced when women are recognized as managers of water and waste and get support, functions and training. Giving these inputs often requires obtaining support of the men first, to prevent obstruction or jealousy (see also, section 5.1). Enhancement of status also occurs from being better able to preserve hygiene, as little is more discouraging than to see endless efforts to maintain cleanliness thwarted by the insanitary and contaminating conditions of one's environment ¹⁾.

¹⁾ as described e.g. for Mexican slums by Sylvia Chant.

Some social benefits will require special attention, e.g. meeting opportunities at waterpoints for women in segregated and secluded cultures (or alternative meeting opportunities when household taps or latrines are installed), or schools when children (girls) are freed from water collection and having to help at home.

Economic benefits

In some cases, substantial reductions in time used for water collection, waste disposal and domestic hygiene is possible, or water is needed and becomes available for small-scale production (animal husbandry, horticulture, brewing etc.). Economic use of time and water gains can be enhanced when the technical design and the other components of the project are planned accordingly (e.g. marketing investigations, skills training, access to credit, see section 2.2).

Health benefits

Health benefits of water and sanitation projects can be optimized when women can collect and use more water (distance, reliability) and can store and draw this water in a safe way; and when they can also improve other conditions and practices which form a disease transmission risk in their daily environment. As these conditions and practices are highly local and culture-specific, optimizing health benefits is only possible when women are actively involved in risk identification and problem solving activities.

Objective measurement of health benefits, for women as well as their families, is often difficult. Most countries do not have very accurate health statistics and when analysing these statistics it is often not possible to distinguish between villages with and without an improved and functioning water system and sanitation. It is however possible to measure behavioral change and thus get a good indication of the possible benefits. Community-based monitoring systems can be used as part of this process and are also an education tool for the villagers and local management bodies themselves. These systems and the roles of women in them are discussed in the next section.

3.7 Community-based monitoring systems

When communities manage their own water resources, water supply and sanitation programme, both they and the regional or national agencies responsible for overall management will need to keep track of performance. This applies to technical performance (operation and maintenance, quality and quantity preservation, use and stock of spares), administration (e.g. number of users, income, expenditure, balance) and health and hygiene (e.g. upkeep and use of facilities).

Increasingly, villagers are therefore trained to pay monitoring visits to the facilities and keep up a simple registration system. An example is the records on frequency, duration and nature of breakdowns for the maintenance of the water supply, kept by the mechanic/scheme attendant and the village water committee (e.g. in some projects in Tanzania and by women tap attendants in Kerala). Upkeep and use of institutional latrines and on number, hygiene and use of domestic latrines are monitored by the school, the village health worker, a voluntary association and/or the village water or health committee, e.g. in Gujarat and Kerala, India.

Simple bookkeeping training is very crucial for financial monitoring and control and is now given in more projects.

Monitoring has a gender aspect when dealing with the questions of who are best placed to collect the data and with the use of this data as a tool for management and control.

Record keeping and reporting on waterpoints are often best done by women, as they visit waterpoints daily, are the first to note problems and have a personal interest in speedy repair. Moreover, keeping a record book increases the status of a job as tap attendant or pump mechanic. Women who are not literate have been able to keep records with the help of their children or the project has developed a pictorial record system (sanitation project Uttar Pradesh).

Monitoring which requires home visits (e.g. in latrine projects) is often more acceptable culturally when done by women. To avoid overburdening, special measures may be required, such as, selecting women who have time and are accepted/respected by other women; helping to organize the work, getting support from other women (neighbours, relatives) who help with child care or domestic work.

The situation should be avoided that women (and men) do all physical work of monitoring and reporting without knowing what is done with this data, without seeing its effect and without having a possibility to relate their findings to the subsequent management of the water system/ sanitation project.

4. PROJECT MONITORING, REPORTING AND EVALUATION

4.1 Monitoring and reporting of project progress

Many water and sanitation projects still report only physical and financial progress: number of pumps, latrines installed, number and type of major works completed (such as intake, transmission line, storage tank, treatment plant), kilometres of pipeline laid, and amount of funds spent versus amount budgeted.

Less common is that a project also monitors and reports on the community participation and health education activities implemented, e.g. number and type of meetings held, community organizations revived/established, trainings given. It is also uncommon that this reporting is village- and gender-specific, e.g. what proportion of the village population has participated in a project meeting or hygiene education activity and how was the proportion of males and females.

Although some (key) figures on male/female participation can be very revealing, they say little about the qualitative aspects of the programme. The mere fact that women are present in a meeting, attend a health education session or are formally a member of a local management committee does not tell whether their opinion is asked and taken seriously. More revealing is data on the type of health education methods used (women as passive audience or as active planners?); on whether female committee members also attend committee meetings; whether decisions are taken in these meetings which reflect the women's view; and whether female functionaries are known to and in contact with the other women.

It will thus be very important to establish a number of valid and gender-specific indicators to monitor both quantity and quality of community participation and health education

4.2 Gender-specific assessment of sustained functioning, use and hygiene

With the poor continuity of many completed projects in mind, donors and national governments now pay much more attention to sustainability and replicability of the facilities, also at the village level. Typical questions are:

- Does the water supply still function and what is its performance in terms of quantity, quality, reliability and drainage?
- Are safe water supply and waste disposal facilities used by all or the majority, in all seasons, and in an hygienic manner? What are the facilities like at public institutions (schools, health centres)?
- Has the service been expanded to new settlement areas in the village, or have new people taken a connection/built a latrine/waste pit/smokeless stove?
- Are local hygiene education activities continued? Are (can) promoted hygiene practices (be) practised?

A gender focus to such assessments is urgently needed. For example, on functioning of services: what is the role of local men and women in operation and maintenance, management, cost financing? Who does the work and who has the training, function, payment? Are men, women prepared for the technical and administrative tasks involved? And have they access to external support when required?

Other questions deal with the difference made by men's or women's involvement: Do, in view of women's high personal interest, technically sound systems with a high involvement of women perform better than systems where women's involvement is low or absent? Does the fact that especially women are selected to function as treasurer, make a difference to training and to the financial management of the system?

Yet other questions deal with gender-specific use: Who are using the water supply/waste disposal facilities and for what purposes? Do men, women benefit differently, e.g. with regard to economic use of water/waste?

Nor can the services be static: in order to sustain the local service level, water supplies need to be extended and construction of sanitation facilities continued. It will be important to find out who have been able to build such new facilities: is it only the wealthier men and women in the better-off villages, or have new households in poor villages/households also been able to obtain access?

When male and female leaders/representatives take part in such an assessment, the activity can be a learning event for the agency/ donor as well as for the village itself.

4.3 Measuring the impact of the project on men and women

Impact on women

As water supply and sanitation projects benefit especially women, it is not surprising that projects have looked especially at the impacts of the project on this group. Usually, this is done in a qualitative and indirect manner, by describing water supply and waste disposal conditions and the work and influence of women before the project as well as afterwards.

It is also done more directly, by asking the women for their view. This so-called change analysis is useful, because it documents the felt impacts of the project, e.g. on ease of management, time, production, leadership, organization, self-confidence, technical and administrative know-how, cleanliness, privacy, safety, etc.

Impact on men and cooperation between men and women

It is less common that projects also look at the changes for the men and in the cooperation between men and women. Yet these aspects are also important, as water supply and sanitation projects are projects for the whole village and require the support from women as well as men. Continued support from either category will depend on the degree to which each group feels they benefit from the project.

In this respect, attention to men's felt benefits can prevent that they may see a domestic water supply or improved sanitation as especially convenient for the women and not as very relevant for themselves, since without a working modern water supply there will still be water brought to the house and problems with waste are also more a woman's problem. Any change analysis, including the assessment of unwanted side effects, should therefore preferably be carried out with men as well as with women, and the men be made aware of the relevance of an improved water supply or sanitation for the whole family.

Impact on health

To indicate the project's impact on health and hygiene, the collection of more quantitative data on health practices is advised. As mentioned before, showing a statistical impact on health is quite difficult, due to the long time span required and the likelihood of intervening variables in a field condition. If projects want to assess health benefits, it is therefore more useful to evaluate water use and hygiene practices:

- Is more water collected and used than before?
- Is water quality improved a) in the system b) in the homes?
- Do all families use only the improved water supply, at least for drinking?
- Have waste disposal conditions improved?
- Have risky hygiene conditions and practices in the village been reduced?

As hygiene tasks and practices differ for men, women and children, it will be necessary to collect separate and usually somewhat different data from each category and to do also the data analysis in a gender and age-specific manner. Guidelines on how to do this kind of study have recently become available as a follow-up to an international exchange of experiences on water use and hygiene studies².

Impact on economic conditions

Measuring the economic impact of the improved water supply or waste disposal is useful in those cases where the difference with the original situation is large and where other economic requirements, such as land, credit, training, transport and jobs were either already available or have been included in the project.

The measurements should include time and water use by women and be done in a village or area with an improved service and a matched control village or area without such a service (comparative study). Alternatively, data can be collected on time and water use both before the project and afterwards (before-after study). The third, and most costly, possibility is to combine the comparative study and the study over time, by using a so-called experimental design (a before-after study in a study and control area).

² Boot, M. (1992). Forthcoming

A review of existing studies (Kamminga, 1992) has shown that a methodological sound study design is essential.

5. METHODS AND TOOLS

5.1 Getting support for women's involvement

Reasons for obtaining support

Although women are the most involved in and knowledgeable on domestic water supply and sanitation, both men and women often assume that projects to improve these conditions are carried out with men. Hence it is necessary to get the understanding and support for women's participation from the men as well as the women. Furthermore, it should be understood by both categories that as women are often in a backward position special efforts for their involvement are needed.

When this need for catching-up action is not understood and accepted, men have sometimes felt excluded or bypassed by the project. Another effect has been the creation of competition with undesired side effects for both, e.g. when a men's group in Kibwezi, Kenya started growing tomatoes for income near a pump when they saw a women's group being successful in this, with the result that the market was flooded by tomatoes and the price collapsed.

Methods for obtaining support

To get support for women's involvement from the men, it is necessary to contact the male village leaders early in the process and to explain why the involvement of the village women in planning and decision-making of the project is wanted. The leaders can then be asked advice as to how best to get into contact with the women and be asked to support the project's initiatives.

Having female project staff to meet with the village women is an advantage, but male staff have also been accepted when they were supportive to women's involvement and the purpose of their efforts was understood and accepted. This has even happened in countries where men from outside the family would normally not be able to meet with women (e.g. in Bangladesh). Often there is also a female intermediary who can contact and gather the women and introduce a male project worker. She is a local woman who by virtue of her training and position, e.g. as village health worker or schoolteacher, is acceptable as intermediary to both genders and has got sufficient respect, status, commitment and confidence to take on this role in her village.

A major step for getting the support of the women for their participation is to give them information about the project and on why and how to take part in local decision-making and in management. Ways of getting information to reach women are given in 5.2. A second step is to bring them together and achieve a more united support. This can be done either through separate meetings (see 5.3) or by working through some existing forms of women's organization or network. However, women's organizations do not necessarily reach all women. Especially poorer women are often not a member of a formal women's organization and to reach these women other channels will have to be employed, such as contacts at women's gathering places or evening meetings with them in their own part of the village.

The nature of a first gathering with local women will often be one of joint problem identification and inventorization: what do women do now with regard to water supply and sanitation; is either a problem and if yes, in what respect; and how does this problem related to other issues of concern the women have, and how they could be involved in the project. A further theme is how to get the support of the men (especially husbands and fathers) for women's participation. This has often led to valuable suggestions from the participants as to what the project and the women themselves can do to prevent problems and overcome constraints.

Where women have never met on a communal problem before, such discussions are often an eye opener and form a first step towards more concerted action.

5.2 Making information accessible to women

Gender-appropriate channels of information

Projects often assume that information given to the men will reach the women next. In practice, this is not necessarily the case, as in many cultures men will not mix public with private matters and so will not discuss a water supply or sanitation project at home.

Neither do men and women use the same information channels. For information on a latrine project in Honduras, men visited meetings and demonstrations, while women relied on information through the radio and through fellow-women. In a latrine project in Pakistan, spread of information and adoption was low, until some women in the neighbourhood who had installed a latrine and were satisfied with it were engaged as promoters and started to tell other women in their neighbourhood.

The same principle of gender-specificness applies to the distribution and display of printed information, such as posters, announcements, etc. An example are posters with health messages which are hung in public offices or in other places not frequented by women.

It is thus important to identify which channels will reach especially men and which are more appropriate for women; whether reaching men or women requires special timing (e.g. of radio broadcasts) and places (for distribution, display, etc.), and to take into account the particular cultural setting.

Pre-testing of information

When information is distributed, it should not only be accessible, but also understandable, acceptable and applicable. Much hygiene education material, for example, is too general, academic (germ theory) or unrealistic (boiling drinking water) to be applied. Pre-testing of materials should take place with each target group and can reveal serious flaws. Several guidelines for simple pre-tests exists which can be used by project staff. (Examples of guidelines will be taken along to the expert consultation and compared with the experiences of the participants).

5.3 Organizing community meetings

The purpose of community meetings is to create a situation in which both community members and project staff feel free to exchange ideas and to learn from each other. It is further a useful means to share findings or decisions from a smaller group with the village at large and to get their feedback and validation.

Women have generally more constraints to attend community meetings and to speak out in them. The following are measures that projects have taken to enhance an active participation of women in general village meetings attended by men and women :

- 1) Time and place: Organize the meeting at a time and place which are (also) suitable for women. Hence, meetings should not be held at times when women have to prepare food or are working in the field and not at places that are far or culturally not appropriate for women to visit;
- 2) Size and setting: Smaller, neighbourhood-level meetings are easier for women to attend and speak out in than large mass meetings.
- 3) Announcement and encouragement: Make sure that information about place and purpose of the meeting reaches the women timely. If necessary use several information channels that are appropriate for women (see 5.2). Emphasize the importance of the meeting for women and encourage them to attend.
- 4) Seating arrangements: Do not leave these to chance, as then the women tend to end up at the back or outside. Rather, arrange the meeting in such a way that men sit on one side, women on the other, or arrange the meeting in a circle or square. In this way, women will be able to hear what is said and sit in a group of fellow-women, which makes it somewhat easier to react than when scattered over the audience, or sitting in the back.
- 5) Meeting language: Women do not always speak the official language of the meeting. Conducting the meeting in the local language or translation by a woman who speaks the local vernacular may be needed.
- 6) Leading the meeting: Reactions from the audience are stimulated by the way the meeting is led. A non-authoritarian style and encouragement of opinions and questions from the audience will help. A break to discuss the information in smaller groups and formulate questions, and the choosing of a spokeswoman by the women participants can help women to also speak up.
- 7) Use of participatory techniques: A short story or parables (live or on cassette), a local play or puppet show, making a communal painting, a series of drawings showing various options, etc. can help start people off and make entering discussions easier for all. (More on use of participatory techniques in 5.7).

The alternative to a general and mixed meeting is to organize separate meetings with men and women, or to organize a separate meeting with women for more detailed discussion and feedback. This second meeting is then held after the general assembly, at which they first could learn about the project.

5.4 Collecting gender-specific data

It still occurs that projects collect data on women's issues from men, or in their reporting and analysis do not make a distinction between the genders and just use 'villagers', 'users' or 'respondents'. The following are some of the steps for making data-collection and analysis more gender specific:

- 1) Assess whether different information should be collected from men and women, or whether the same questions can be asked to both. This will depend for the larger part on the division of tasks and authority in the culture concerned. Asking a man

on the family's water sources or the occurrence of child diarrhoea in the family, for example, is unlikely to yield a reliable answer. For some data, children (boys, girls) will also have to be asked.

- 2) Determine which women should be contacted for which data. In many cultures with extended families, different women in the family have different responsibilities and authority. In some cultures, female heads of families should be contacted first for reasons of respect, whereafter factual information is obtained from the younger female members in the household.
- 3) Whenever possible, interview men and women separately, also when the same questions are asked to both. The viewpoints of either group may be quite different, but such differences tend to stay hidden in joint interviews, e.g. because the husband will answer all questions or the wife does not like to voice any opinion which her husband may dislike.
- 4) Report all human project data in a gender-specific manner and make sure that project information systems (e.g. on participation in village meetings, trainings, committees) make a distinction between male and female participants.
- 5) After collection, process and analyse data separately for men and women, and where necessary, also for the different socio-economic classes and age-groups.

Gender and age-specific analysis of reported data for urinary schistosomiasis in Tanzania, for example, showed that this water-related disease was most common amongst schoolboys and for women and girls between 10 and 40. The former was related to swimming habits, while the latter was associated with the local practice of women and girls to wash clothes while standing in infested water. This finding had both implications for the hygiene education programme and for the wells project, whose ban to wash clothes at the handpumps had forced women to continue their use of open water.

5.5 Strengthening or forming local management structures

A first question to ask when preparing a water or sanitation project is whether there is already an existing community organization which can represent the villagers in detailed planning and take on local management of the water system/ sanitation facilities. Issues to be looked at include:

- the composition: can the organization represent the interests of the different categories of beneficiaries: men/women, domestic users/economic users, wealthy households/poor families?
- the status and mandate: does the organization have the authority/legal status (or in case of a sub-committee: can they derive this status from the higher-level organization) needed to take decisions?
- the dedication, time and capacity: do the members of the organization have more tasks and interests which may impede their work on water or sanitation? Does the organization have the capacity to plan, communicate, supervise, administer, monitor a water supply facility or a village sanitation project? What is their earlier experience?

If an existing organization is trusted, well-suited and able to do the job, it is better to avoid forming a new organization. When only the composition is incomplete, e.g.

because women are not directly represented, it will first be important to establish the need for having women on the organization.

Reviewing the composition

Reviewing the composition of an existing managing organization can be done in a participatory way, for example, by using cut-out pictures of men and women and items they use for water and sanitation related domestic tasks, such as drinking water collection and storage, cattle watering, vegetable growing, health care, waste disposal. A second series of cut-outs also has men and women as well as various 'tools' used in managing a water or sanitation project, such as a cashbox, receipts book, toolkit, blackboard. The group with whom the activity is done is then asked to form two groups: one group of men and women users with various responsibilities in water and sanitation and one group of those who will represent them, and draw connecting lines between each. The outcome of this participatory activity is then used to determine in what ways the present organization should be adapted and how this could be done.

Selecting women on a committee

To facilitate the selection of suitable women members on a water or sanitation organization, several measures can be used, both in the case of expanding an existing organization and in the case of forming a new one:

- 1) Define the tasks: some responsibilities and tasks may be more appropriate to be done by a woman than a man. Examples are communication with other women, management of health/ hygiene aspects, financial management. Other functions and tasks may be more likely to be held by a man ³⁾.
- 2) Determine the requirements (time, characteristics) for the job;
- 3) Jointly identify the type of women that have the basic requirements for the job;
- 4) Identify and contact possible candidates and, when interested, help them obtain acceptance and support from their environment;
- 5) Select at least two women on the organization for mutual support;
- 6) Make sure that training and periodic support are available to them.

The above tasks are best carried out together with a group of women from the community, as they know the local situation well and can help identify, contact and support suitable local candidates.

To collect data for projects, the use of large surveys is not always necessary: separate group interviews with men and women, or the use of gender-specific tools for participation ⁴⁾ are other ways of collecting data in a gender-sensitive way.

³⁾ The gender-specific allocation of responsibilities may be done as a participatory group activity. See: "Water Committee Responsibilities" in Srinivasan, 1990, p. 117.

⁴⁾ An example is the participatory technique of pocket voting. For this technique, a series of pictures giving various options, such as different sources of water, different types of technologies, or different types of projects is put on a wall or clothes line. Under each picture is an envelope, pot or other receptacle. A mixed group of participants is given two different colour cards: one colour for the men, the other for the women. Each person then puts his or her card in the receptacle under the picture which depicts his or her practice or preference. When everyone has voted, the votes for each option are counted separately for men and women and the preferred option is identified (Adapted from Srinivasan, 1990, p. 93).

5.6 Setting up local financing systems

Women's roles in financing

If women are active in managing water supplies or waste disposal services, it is often in financing. They help raise funds, are tariff collectors and treasurers and within the household are generally more willing to pay for construction or maintenance. The financial management of services is often a matter of concern to them and training in financing is one of the first requests they make when training opportunities are available. Key areas of interest are how to raise the funds, how to administer them, and how to account for their proper use.

Fund-raising

Choosing a financing system is as choosing the technology: there is not one system that is appropriate in all cases, and one has to look at what way of financing is the most appropriate under the local circumstances. There are many ways to raise funds, both for construction and for operation and maintenance and the men and women in the community are the ones who can best predict which system is most suitable for them, especially when each option is discussed with them, so that they have sufficient information to make a wise decision.

A first choice to make is the payment system: a collective system, such as public fund raisings through meetings, bazaars, door-to-door collection, a women's group hiring themselves out as agricultural labour, etc. or regular payments per participating household. General fund raising can be easier and demand less work and administration than scheduled payments, but can also be less equitable, as there is no guarantee that all beneficiaries will contribute and that voluntary payments reflect their capacity, or that all who want can join a group that raises funds for members' facilities. For individual household payments there are several options:

- the payment unit: each household pays as a unit, or each adult member pays separately;
- the size of payment: payments are the same standard figure for all, e.g. Shs. 20, Rs. 600, K. 2; or all households/household members pay the same, but the amount depends on the actual costs of the service;
- the differentiation: those who use more water (higher incomes, larger housing, economic use), or get a more expensive design, or can afford to contribute more pay more;

Gender aspects to consider are whether poor women, such as single parents, can take part without contributing a disproportionately large part of their income, and how payments within households are divided between men and women. It may for example turn out, as it did in a project in Western Kenya, that while the whole household benefitted, it was the woman who paid, or that when men and women pay equally much from their own incomes, the women contribute a relatively much greater share of their resources than the men.

Fund-collection

A second choice to make is how the funds will be collected and what implications this has for the men and women involved.

- payments at a central place: may be less feasible for women than for men;

- home collection: during the day may be culturally more appropriate to be done by women, but may involve considerable amounts of work and pressure;
- payments to one person in the neighbourhood: often easier, but safety and accountability, both of the collector to the committee and the committee to the collector ('how were funds used') have to be assured;
- savings account or fund: enables women to deposit small amounts and enables poor people to join projects which want larger payments as deposit or tariff

Financial administration

Training those acting as treasurers in simple budget making and bookkeeping skills is a key condition for better financial management. Existing accountancy systems are often too complex, especially where levels of numerical literacy and experience are low (women!), so that a more simple and especially practical system usually has to be developed with the help of the women concerned. Where inflation is high, direct conversion of cash into materials, equipment and spares may be preferred, which then has further consequences for village stock keeping and -administration. All trainings in financial administration should be organized in such a way that they are also accessible for women (see 5.7)

Accountability

Another training issue for village treasurers, committees and users is how to account for financial and operational performance.

- Treasurers: will have to know how to make simple summaries of costs and expenditures and how to present these to the committee and to general assemblies of the users;
- Committees: will have to know how to account to the users for their performance;
- Users: should know of their rights and how they can arrange for accountability, e.g. through statutory annual meetings and an independent audit committee for checking the books.

Statutory meetings should preferably be attended by a defined minimum of male and female heads of families, and where water users associations exist, both the male and the female head of member families should be a voting member right and be eligible for functions on the board or management committee.

5.7 Training of women functionaries

Special methods are usually needed to make training accessible and applicable for village women.

The venue where the training is held is very important. Usually, the closer the training is to where the women live, the easier it is for them to participate. It is often possible to organize a village-based training and bring the trainer, materials and equipment down to the village, or use the village equipment. This can be done either per village, or for a group of neighbouring villages.

When the training has to be held outside the area, special arrangements will be needed to make it possible for women to attend, e.g. arrangements for transport and for women to travel and attend as a group in areas where their mobility is restricted, contact of male relatives for permission (e.g. by influential village leader) and arrangements for child care, either at the training venue or with the other women at home.

Duration and timing of the training are other important aspects. Women cannot easily stay away for longer periods, so a short training, allowing women to be home for chores in the early morning and at the end of the day, is often the best. In agricultural societies, the off-season will be the best time for training.

The contents and methods of the training should be practical and realistic. Too often, trainings on e.g. health or bookkeeping are still too academic, so that the women cannot apply them in their village and at home. A classroom-type setting and use of lecturing as training method are also not very appropriate for active learning by the participants. Changing the training methodology and techniques is usually not so easy, since both trainers and trainees are used to conventional training techniques and not to modern methods of adult education. Often, a re-training of the trainers is required (see section 5.8). Areas with a low literacy of women will require special adaptation of training methods and materials.

Training need identification for project staff

Although being a woman is an advantage in contact with and training of village women, it does not make female project staff automatically skilled in working with women and being gender-conscious. When identifying or recruiting female staff at the start of a project, or when working with male staff who have to involve women, it will thus necessary to review and discuss how the staff work with women and whether they are aware of gender differences and apply these in their work. This will show whether there is a need to update the knowledge and skills of the project staff in these two areas.

5.8 Participatory techniques for project personnel

Although village assemblies, group meetings and discussions and committees play a prominent role in any project for rural water supply, sanitation and water resource protection, they are by no means the only tools for community involvement.

In the disciplines of adult education, community development and WID research (e.g. in agriculture), various more creative techniques for involving local men and women have been developed. Examples are the work of World Education, the DELTA technique (Development Education and Leadership Teams in Action) used in Kenya and Zimbabwe and participatory research techniques such as those used for participatory rapid rural appraisal by Samakya in India.

The project of PROWESS (Promotion of the Role of Women in Water and Environmental Sanitation Services) has developed such techniques especially for the water sector. Familiarity with these techniques can help project staff to use more creative ways of working with village men and women. The material can also stimulate them to develop their own local materials and techniques. All techniques are suitable to be used with women and men. Some of them ⁵⁾ are especially designed to make participants more aware of the importance of women's involvement.

⁵⁾ Women's participation in WSS, Water committee responsibilities, Analysis of work done by men and women.

6. WATER SUPPLY, ENVIRONMENTAL SANITATION AND WATER RESOURCE PROTECTION: CONCLUSIONS ON THE GENDER DIMENSION

Projects to supply drinking water, improve sanitation conditions and protect drinking water resources have both functional and developmental aims. Functional aims are that the quantity and quality of water resources are maintained, the water supplies function well, the environment is protected, and conditions and practices of environmental sanitation and hygiene are improved.

The projects can also have a more fundamental, developmental aim. In that case they not only improve local conditions and practices, but by the way in which they work with the people they also strengthen the latter's capabilities to bring about and preserve these changes, improve their living conditions and stimulate the undertaking of new development activities in their homes and communities.

Development goals are realized when the projects do not make things *for* the people, but when improvements are as much as possible made *with* them and *by* them. Projects which treat people as dependents and (passive) beneficiaries unavoidably create dependency, while projects that treat people for the local decision makers and managers of their environment which they are, enhance the capabilities of the people to make and sustain their own improvements, either independently, or as partners in the more complex projects which combine a number of actors.

In this development process, men and women each have their own distinctive tasks, responsibilities and authority. This is also clear in the water and sanitation sector. Women and men have their own patterns and interests in the selection and use of water sources, in environmental sanitation and in the use of the land surrounding the water sources. In the homes as well, the expertise, felt needs and dealings with various aspects of water, sanitation and hygiene are gender-specific and socialization, whereby boys and girls each get familiar with the accepted patterns of their own sexe, starts at an early age.

Initially, it has been assumed that women and girls are only concerned with water use and hygiene inside the house, so that they were mainly involved in water and sanitation projects as (passive) target groups for hygiene education. More research on how tasks and responsibilities are divided amongst the sexes has shown that in reality the situation is much more complex, and that both men, women and children are involved in, and have specific knowledge, tasks and requirements on water resources, water supply and environmental sanitation in the house, the neighbourhood, the village and the surrounding area.

It has been found further that focusing on women and children as audiences, rather than planners and actors, and forgetting the specific responsibilities and behavioural needs of men reduces the effectiveness of technology projects and hygiene education programmes in the sector. The number of projects which apply a more gender-sensitive approach, involving men/boys and women/girls as distinct actors and managers is now gradually increasing.

There is another reason for dealing more carefully with gender issues in the water sector. Since projects in the water sector are typical community projects, which can only have an impact when they have the support and participation of the community at

large, the insight is growing that women and men need both to be involved. By now, large amounts of qualitative and quantitative evidence exists that bringing the women in has benefits for the project (service) as well as the women themselves, but that also care has to be executed not to bypass the men and overburden the women.

Moreover, gender-based roles and relationships are not static. Project accounts show ample opportunities for men and women to fulfil new positions and effectively clothe them with new yet not completely alien responsibilities and power. For example, cases are numerous where the chairmanship in a water committee, as a position of authority, has gone to a man, but the position of treasurer, requiring trust, to a woman.

The arrears which women have when it comes to taking part in village activities and taking up local functions does however require that within this gender-specific approach, specific efforts are built to overcome these constraints, whereby the women themselves can often give useful suggestions on how this can be done.

A gender-sensitive approach thus takes into account the existing roles and relationships between the genders, but also builds up *new* capacities in men *and* women, which contribute to more effective projects as well as a more equitable distribution of work, power and benefits.

BIBLIOGRAPHY

Chapter 2

- Agarwal, Anil and Anand, Anita. Ask the women who do the work. *New Scientist*, November 1982, p. 302-304
- Asian Development Bank. Role of women in water and sanitation projects: checklist for project preparation. In: *Women in development: Water Supply and Sanitation Sector*. ADB, 1986.
- Idem. Guidelines for the design of women's participation in water supply and sanitation projects. ADB, 1986.
- Basic Needs expressed by the community. Tool no. 13 in *Tools for integrating community participation and hygiene education into water and sanitation projects*. Frankfurt, Germany, GTZ, 1989.
- Boesveld, Mary and Postel, Els. Planning with women for wise use of the environment. Research and practical issues. *Landscape and Urban Planning*, 1991, 20, p. 141-150
- Dian Desa. Women and water. A report of a survey for the Asian Development Bank. Jakarta, undated, ca. 1990
- Evans, Phil. The role of women in community management. In: *Community management of improved water supply systems*. IRC, 1992.
- Gender issues. Chapter 9 in Background report of the Appraisal Mission of Phase IV of the Kenya-Finland Western Water Supply Programme. 1992.
- Grady, Heather et al. Assessing women's need in Gaza using participatory rapid appraisal techniques. RRA Notes No. 10. Reading University, 1991.
- Kamminga, Eveline. Economic benefits from improved rural water supply. The Hague, IRC, 1991.
- KfW. Arbeitshilfe fuer die Konzipierung selbsthilf-orientierter Vorhaben der laendlichen Trinkwasserversorgung: Durchfuehrung der Bilanz wasserinduzierter Krankheiten in Form von Aktionsforschung. Frankfurt, 1988.
- Jiggins, J. How poor women earn income in rural sub-Saharan Africa and what prevents them from doing so. Nairobi, Ford Foundation, Women's Programme Forum.
- Morogoro/Shinyanga Rural Water Supply and Sanitation Programme. Workshop material for women participation in rural water and sanitation programme. Undated, c. 1991.
- Mujtaba, T. User reaction study on the Tara handpump. Dhaka, Unicef, 1988.
- Mukerjee, Nilanjana. People, water and sanitation: what they know, deblieve and do in rural India. New Delhi, National Drinking water Mission, 1990.
- NORAD. Water development. in: *Action plan for women in development*, Zimbabwe. Harare, 1991.
- Overholt, C. et al. Women in development: a framework for project analysis. In: Overholt, C. *Gender roles in development projects, a case book*. Kumanian Press, Inc. Connecticut, 1985.
- Problem identification. In: Isely, Raymond B., Yohalem, David and Lythcott, Micheal, *A workshop design for community participation*. WASH Technical Report no. 33, 1984.
- Secretariat for the Global Consultation on Safe Water and Sanitation for the 1990s. *Creating a safe environment for better health: water resources, sanitation and the environment*. New Delhi, 1990.
- Singh, B. et al, 1991. Rural water supply in Kerala: how to emerge from a low-level equilibrium trap. Unpublished paper, 1991.
- Stamp, Patricia. *Technology, gender and power in Africa*. IDRC, 1989.

- Steps to identify the need for sanitary improvements. In: Wegelin, Madeleen, On-site sanitation: building on local practice. IRC Occasional Paper 16, 1991.
- Sundararaman, Veena. The social feasibility study in the role of women in rural sanitation. Report of the study in four villages in Maharashtra State. Bombay, India, SNTD Women's University, Research Centre for Women's Studies, 1986..
- Tunyayvanich, Nongluk et al. Women, water and sanitation in the rural North-East of Thailand. Baseline study. Bangkok, Mahidol University, 1987.
- United Republic of Tanzania. Water Master Plans for Iringa, Mbeya and Ruvuma regions. Vol. 12, 1982
- My needs and yours, in Navamanga, Handbook for building women's self-reliance. The Women's Bureau of Sri Lanka
- Women and water: domestic shallow well water supplies. Proceedings of a regional seminar. Manila, The Philippines, 29 August-1 September 1989. IDRC.
- Under- and overestimation of economic benefits. in Drinking water supply and sanitation projects, impacts on women. Annual abstract journal, no. 2, NORAD/PROWESS/IRC, 1992.
- Werkboek Gender in de tropische cultuurtechniek. Wageningen, LUW, 1991.

Chapter 3

- Battaglini, Maria Teresa. The female task of resource management. Cooperazione, 1990.
- Boucher, Lisa. Women and water in the village water supply project, Togo. In Zandstra, Ilse, ed. Seminar on the participation of women in water supply and sanitation programmes. Ottawa, IDRC, 1987.
- Chachage, C.S.L. et al. A study on women's involvement in the implementation of the programme. Dar es Salaam, 1990.
- DGIS. Women, energy, forestry and environment. Policy on an operational footing: main points and checklists. The Hague, 1990.
- Donnelly-Roark, Paula. Women and water. In Peter Bourne, ed., Water and sanitation: economic and sociological perspectives. New York, Academic Press, 1984.
- Espejo, Norah. Water committees in Latin America: tasks and training. The Hague, IRC, 1989.
- INSTRAW. Involvement of women in the choice of technology and implementation of water supply and sanitation projects. Women, water supply and sanitation: a national training seminar. Kadugli, Sudan, 1988.
- idem. Participation of women in planning, choice of technology and implementation of sustainable water supply and sanitation projects. Module II. ILO/INSTRAW/UNDTCD Training programme Women, Water Supply and Sanitation. 1990.
- IRC. Community participation and women's involvement in water supply and sanitation projects. Occasional Paper 12, The Hague, 1988.
- Janssen, Resi. Vrouwen, mannen en drinkwaterbeheer: een onderzoek naar het functioneren van pompkomitees in Burkina Faso. LUW, Wageningen, 1988.
- Kompaore, S. Women as managers of village water resources. Natural Resources Forum, November 1989.
- Lenton, R.L. (1982). Ford Foundation programs in water resources management in Asia. Paper presented at Asian Water Resources Workshop, East-West Centre, Honolulu, September 13-17.

- Mauluka, Linda. Community participation in the construction and maintenance of rural groundwater supplies. In Malin Falkenmark and Jan Lundquist, eds. *Water for all: cooperation, education, participation*. University of Linköping, 1983.
- Paqui, Hilda. Malawian women keep the pumps flowing. *Source*, 1989, 1,2, p. 8-9.
- Perrett, Heli. Involving women in water supply projects. World Bank/UNDP, TAG Advisory Group, 1986.
- Poluha, Eva. Dodota water supply project, Ethiopia. *Development Journal*, 1990, 3, pp. 39-43.
- Socio-economic Unit. Women in the water and sanitation programme. Trivandrum, Kerala Water Authority, 1991.
- Sharma, Hira. Now women of Tharu Scheduled Tribe ensure drinking water through India Mark-II handpump. Lucknow, Jal Nigam, 1989.
- Sudjarwo, Christine. Final report on the introduction of PVC handpumps in Indonesia and the involvement of women in handpump technology. Yogyakarta, Yayasan Dian Desa, 1988.
- Tomoda, Susan et al., Women and special public works programme. A case study of the Mto wa Mbu irrigation and the water supply projects, Tanzania. ILO, Geneva, 1987.
- Valera, Mediatrix. Water and women: experiences in the village handpump (Philippines) project. In Ilse Zandstra, ed. *Seminar on the participation of women in water supply and sanitation programs*. Ottawa, IDRC, 1987.
- Versteijlen-Leyzer, Dorothee. Integrating women in development: the experience of nine EDF rural development projects. *The Courier*, 125, January/February 1991.
- Wacker, Corinne. Participatory development planning for sustainable development with women's groups in Kenya: water projects in Laikipia. University of Zuerich, 1990.
- Water Resources Commission. Interagency expert consultation on a strategy to enhance women's participation in water supply and sanitation activities. Addis Ababa, 1991.
- WHO. Roles of women in water supply and sanitation, a programme checklist. In: *Women, water and sanitation*. Geneva, 1985.
- Yoon, Soon-Young. Water for life. Paper presented at the Symposium on the impact of environmental degradation and poverty on women and children. Geneva, 1991.
- Young, N. Nicaragua: Testing the water, from village wells to national plan. London. CIIR, 1989.
- Zacharias, Elizabeth. Approaches to involvement of women in the SEU activities. Calicut, Socio-Economic Unit, Kerala Water Authority, 1991.

Chapter 4

- Bah, Osman. Women and water supply development in Sierra Leone. *Journal of Rural Development*, 1988, 11, 1, p. 97-109.
- Carr, Marilyn, Sandhu, Ruby. Women, technology and rural productivity: an analysis of the impact of time and energy-saving technologies on women. New York, UNIFEM, 1988.
- Devi, Shamala. A study of the effectiveness of women handpump caretakers programme in Bagepalli Taluk, Kolar District. New Delhi, Danida, 1988.
- Elmendorf, Mary. Review of Decade impact on women. In: *The IDWSSD and women's involvement*. Geneva, WHO, 1990.
- GTZ. Indicators for success. Community participation and health education in water supply and sanitation: how to measure progress and results. Eschborn, CTZ, 1989.

- Hannan-Andersson, Carolyn. The challenge of measuring gender issues in water and sanitation. Paper presented at the workshop on goals and indicators for monitoring and evaluation of water supply and sanitation. Geneva, 1990.
- idem. Domestic water supply improvements in Tanzania: impacts on rural women. Dar es Salaam, SIDA, 1985.
- Jonsson, Stefan, Rudengren, Jannica. An economic appraisal of a handpump maintenance system using women mechanics. Stockholm, Stockholm School of Economics, 1991.
- Overcoming the gender barrier: several voluntary agencies are working to provide rural women with greater control over natural resource use. In *Down to earth*, August 1992, p. 45.
- Perrett, Heli. Monitoring and evaluation of women's participation. In: *Involving women in sanitation projects*. TAG Discussion paper no. 3. World Bank, 1985.
- UNDP. *Women in UNDP-supported projects: a review of how UNDP project evaluations deal with gender issues*. New York, UNDP, 1987.
- Zimbabwe National Action Committee. *Assessment of the impact of IRWSS projects on gender participation*. Harare, NAC, 1991.

Chapter 5

- ESCAP. *Training manual on managing development programmes for women*. Bangkok, 1987.
- Flanagan, Donna. *Community water supply: a manual for user education*. Geneva, ILO, 1987.
- Gurung, Y.K. et al. *Women involvement in community water supply and sanitation projects*. Approach paper. Pokhara, Community water supply and sanitation programme, 1989.
- Narayan-Parker, Deepa. *Participatory evaluation: tools for managing change in water and sanitation*. New York, PROWESS, 1990.
- Simpson-Hebert, Mayling. *Methods for gathering socio-cultural data for water supply and sanitation projects*. TAG Technical note 1, Washington D.C., World Bank, 1983.
- Srinivasan, Lyra. *Tools for community participation. A manual for training trainers in participatory techniques*. New York, PROWESS, 1990.
- Wijk, Christine van. *Participation of women in water supply and sanitation: roles and realities*. The Hague, IRC and PROWESS, 1985.
- UNCHS. *The role of women in the extension of low-income housing projects*. Training module. Nairobi, 1986.