TURIN CENTRE

UN INSTRAW

UN DTCD

WOMEN, WATER SUPPLY AND SANITATION

multi-media modular training package

MODULE III

ROLE OF WOMEN IN HYGIENE EDUCATION AND TRAINING ACTIVITIES FOR WATER SUPPLY AND SANITATION PROJECTS

The present training modules on **"Women, Water Supply and Sanitation"** comprise an up-dated revision of the modules originally prepared in 1986 by the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) and the ILO Training Centre, in Turin, Italy.

This version, has been undertaken as a collaborative effort by INSTRAW, the ILO Training Centre in Turin, Italy, and the United Nations Department of Technical Co-operation for Development (UN/DTCD), through its Task Force on Women's Development. The production of the training packages was funded by UN/DTCD.

The DTCD Task Force, established in 1982, is the oldest such entity in the United Nations system, and comprises collective expertise and experience in all substantive sectors within the Department's mandate: natural resources and energy; development planning; statistics; public administration; population; and social development. The prime objective of the Task Force is to promote the integration of women in all aspects of development. The issuance of the up-dated modules is an initiative towards that end.

The training package was **up-dated** by **IRC**-International Water and Sanitation Centre, The Hague, The Netherlands. It was **reviewed** by **Ms Dunja PASTIZZI-FERENCIC**, Director, Natural Resources and Energy Division (UN/DTCD), **Mr. Kenneth EDWARDS**, Chief Water Resources Branch (UN/DTCD), **Ms Margaret HOWARD**, Programme Officer and **Ms Marcia BREWSTER**, Programme Officer, Water Resources Branch (UN/DTCD). The training package was **completed** and **finalized** by **Ms Borjana BULAJICH**, Social Affairs Officer, UN/INSTRAW.

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The modules are conceived as a package containing all the information, examples, exercises, audiovisual and control aids necessary for:

- the **trainer** to deliver a lesson or conduct training activities;

and/or

- the **trainee** to analyse, reinforce and apply the theoretical concepts learned during training sessions;

and/or

- the **professional** as self-learning reference material to upgrade knowledge and skills related to effective integration of women in WSS sustainable projects and programmes.

In order to reduce the learning time and improve the learning efficiency, keeping high the motivation of the user, the text of the module contains only that information and activities considered essential for the achievement of the training objectives as specified in the following pages. Additional reading material is included for those users who wish to study in greater depth specific subjects related to the subject considered in this module.

From a pedagogical point of view, the structure of the modular package consists of five components – as specified on the following page – which are easily adaptable to the needs of both the trainer and the trainee.

1. *INPUT DOCUMENT*

1.1 Target groups

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The trainer will make use of the five components indicated above, while the trainee will only be provided with the material related to components 1, 2 and 3.1.

- Senior officials of Ministries of Education, Health, Planning, Public Affairs, Social Welfare, etc.
- Development planners and provincial or local authorities in charge of water supply and sanitation projects and programmes.
- Engineers in charge of designing and implementing water supply and sanitation projects..
- Representatives of non-governmental organizations, including women's organizations, which are active in water supply and sanitation projects and programmes.
- Trainers and managers of national training institutes training staff on drinking water and sanitation technologies, health education, community development and women's programmes.

GENERAL OBJECTIVE

To enable the users to understand the importance of including hygiene education as a component of WSS projects as well the need to train women at all levels of WSS projects and programmes.

SPECIFIC OBJECTIVES

On completion of this unit, the users will be able to:

1. Identify major links between WSS projects and health/hygiene education;
2. Recognize more effective forms of hygiene education and the roles of women in hygiene practices;
3. List the main steps for the preparation, implementation and evaluation of the training programme;
4. Identify those training components of a training programme in which women must be included.

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1. *LINKING HYGIENE EDUCATION TO WATER AND SANITATION PROJECTS*

One of the main problems most developing countries face is water and sanitation related diseases. The World Health Organization estimates that these diseases account for **80% of all diseases** in the developing world. **Water-borne diseases** are also a major cause of high infant mortality rates. An estimated five million **children** in the world **die annually from diarrhoeal diseases,** of which some one-third are related to water. Water related diseases also account for **15% of all hospital deaths** and cause the loss of millions of working days every year. This leads to increased medical costs and decreased productivity, thereby helping to perpetuate the vicious cycle of poverty.

1.1 Women and water sanitation-related diseases

Scarcity of water is a major factor in the transmission of diarrhoeal and skin and eye diseases. (WHO (1983). Maximizing benefits to health. Geneva, World Health Organization.) Where women have to walk far to get water, they are forced to limit the amount collected to the bare minimum, and use less water for personal and domestic hygiene.

> *Studies by Cairncross of the London Institute of Tropical Hygiene show how women walking for 1 hour or more collect around 6 liters per capita per day. When collection time decreases, they collect more, until the amount stabilizes around 15 l/c/d when the collection time is between 10 and 30 minutes. When taps or pumps become available within 5 minutes' walking distance consumption then rapidly increases to between 20 and 50 l/c/d.*
> *(Cairncross, S. (1987). The benefits of water supply. in J. Pickford, ed., Developing World Water II. London, Grosvenor Press, p. 30-34.)*

Bacteriological contamination of drinking water is another important cause of transmitting diarrhoeal diseases. Partly, this contamination is due to the lack of protection of water sources and the absence and use of proper excreta disposal facilities, and partly to contaminating behaviour at the source and during water transport, storage and drawing in the home.

> *More than a dozen water quality studies show that contamination of safe water in the home can be both common and large. Yet women almost universally store drinking water very carefully, in separate and often covered containers. Main reason seems to be the -unconsciously- touching of the water with soiled hands during collection or when taking out water with a communal cup.*

Dracunculiasis, a disease spread by guinea worms, is another widespread water-related disease. It is transmitted when a person with guinea worms stands in water, to collect drinking water, or to bathe or wash clothes. The larvae of these worms emerge through the person's skin and enter small cyclops, tiny shellfish which live in the water and are hardly visible to the naked eye. When the same water is drunk by another family, they swallow the cyclops and the larvae, which then grow into full worms, ready to cause another skin wound and infect others.

Dracunculiasis affects 10 million sufferers each year. Its transmission is so widespread that it can incapacitate up to 30% of a total village population for 1–3 months per year. In south-east Nigeria, this caused a loss in local rice production at an estimated value of US$ 20 million per year. School absences may be as much as 50% during the 'guinea worm season'. But dracunculiasis is also one of the water-related diseases which women can help to eradicate totally.

> *One way is to use only safe water sources, e.g. when a water project helps the community to convert stepwells into ringwells, or install a closed waterpoint such as a standpost or handpump, reliably and conveniently enough to use for all drinking water the year round. A second way is to keep people with emerging worms from entering water sources used for drinking and to filter all drinking water through a cloth to retain and discard the cyclops. By such means alone, two villages in Burkina Faso managed to eradicate guinea worm infections in two transmission seasons only.*
> *(Hopkins, D.R., Target 1995: guinea worm eradication. Waterlines, 8, 2, 6-7.)*

Schistosomiasis (bilharzia) and onchocerciasis are other water-related diseases to which women and girls especially are prone because of their regular contacts with water.

> *Between the ages of 11 and 40, the reported incidence of urinary schistosomiasis in a household survey in Tanzania was significantly higher for women and girls than in any other population group, probably due to their prolonged standing in the water while washing clothes.*
> *(Kirimbai, Mary and Wijk, Christine van (1983). Impact of water supply on hygiene improvements in rural Tanzania, a study in 8 villages. Dodoma, PMO and The Hague, IRC.)*

In St. Lucia the longest and most frequent contacts with bilharzia-infested water were also for clothes washing, making women and girls a prime risk group. (FAO, (n.d.), Environmental management for vector control in rice fields. Report prepared for the Panel of Experts on Environmental Management, p. 122.)

A study on onchocerciasis in West Africa showed especially high rates of river blindness in women and children in connection with their places of water collection, bathing

and clothes washing. (Bissiliat, Jeanne (1978). The role of women in the onchocerciasis programme area. Rome, FAO.)

Improvements in practices of **excreta, waste and wastewater disposal** are also crucial for raising levels of public health. Inadequate excreta disposal facilities reduce the potential benefits of safe water supply by transmitting pathogens from infected to healthy persons. **Over 50 types of infections** can be transmitted from a diseased person by various direct or indirect routes involving excreta. Furthermore, the sanitation section is not usually assigned the same importance as domestic water supply. Generally speaking, sanitation in the rural areas is neglected because it is given a lower priority by the rural population, and basic health education, public awareness and a proper institutional framework are greatly lacking. The same often goes for waste water disposal. Insufficient provisions and maintenance of drainage at water points can create new breeding places for mosquitoes and other disease-transmitting vectors. In Egypt and India, for example, the population at risk from filariasis increased up to sixfold as a result of improved water supplies without adequate drainage.

1.2 The importance of hygiene education

If health benefits from improved water and sanitation are to occur, it is thus not enough to install improved facilities. Not only should they also be maintained and used by at least 80% of the families, but all major risks of transmitting water supply and sanitation related diseases in the particular community should be eliminated. This is not the case when half of the people cannot or will not use an improved water supply or latrine, when unhygienic conditions develop around the waterpoints or when safe water collected at the tap gets recontaminated during transport, storage and drawing in the home.

Latrines are only effective when used hygienically by all, and when also used for safe disposal of infants' excreta. They should not become new health hazards through poor maintenance, or contaminate clean groundwater near wells or handpumps. Mothers, in particular, will have to take care that latrines are kept clean and used hygienically, that water and soap for handwashing is nearby and handwashing practiced, and that the latrines are also used for disposal of young children's excreta. Moreover, each latrine should have provisions for use against germ transmission by flies, ranging from long-handled fly-covers over the hole, and the use of hot ashes against bad smells, to full-fledged ventilated improved pit (VIP latrines) and water-sealed latrines.

There is thus a clear need for complementarity of water supply, sanitation and hygiene education. Only if all three are in place, and lastingly and effectively reach all families can an impact on health be expected.

2. *ROLES OF WOMEN IN HYGIENE EDUCATION*

It is obvious that the elimination of local disease transmission risks in project communities cannot be done without the active involvement of the women in these communities. It is they who can best say which risk to tackle and how to do so, since they are key persons in environmental health within the family and the community.

In their family:

- **women are the main providers** of health care for their families;
- they decide **what kind of food** to produce or buy, thus influencing the nutritional status of the family.
- in most places, they are **responsible** for providing water and sanitation, and for the **general hygienic standard** of the home.
- **as mothers,** they convey to their children their own values and understanding of health issues;
- they are **the first to deal with health problems** within the family;
- **women decide** when and how to seek health care outside the home choosing between traditional and modern medicine.

In their community:

- **women** themselves practise as **birth attendants** and provide other kinds of indigenous health service;
- **they transmit old and new health information** through their networks and influence fellow women in adopting new facilities or practices.
- in many areas, they look after traditional water sources, and informally manage community water use.

Involving **women** in **health education programmes, not only as trainees, but also as planners and trainers,** is thus an essential element of any water and sanitation programme. Unfortunately, many programme planners still think that hygiene education can be a substitute for the direct involvement of women in water and sanitation projects, and that merely providing health information is enough to change their health practices. However, from programme findings and research we know that when improved facilities do not meet women's needs or are otherwise unacceptable, adding health education to convince them to adopt new equipment or practices makes little or no difference.

Neither do academic health information on germ and transmission of water and sanitation-related diseases, and directive instructions by themselves lead to improved hygiene behaviour. (Burgers, Lizette et al (1989).Hygiene education in water supply and sanitation programmes. (Technical paper 27), The Hague, IRC.) This will be illustrated further during the discussion session, when group activities will take place to decide on the differences between instructive and open learning methods and the stages in which didactic

methods are most appropriate. (Srinivasan, Lyra (1990). Tools for community participation, A manual for training trainers in participating techniques. New York, UNDP/PROWWESS. Activities 'Resistance to change' and 'Cup exercise'.)

In the planning of more effective hygiene education programmes, it is thus very important to pay more attention **to women as planners and implementors** of improved hygiene conditions and practices at the community and household level, and not limit their roles to one of listening to lectures on health and hygiene.

2.1 Women as planners, users and trainers

While general health information can increase people's theoretical knowledge about water and sanitation, such general knowledge is seldom applied to improve local circumstances and change particular practices. More effective are either a **promotional, or a participatory approach to hygiene education.** (Burgers Lizette (1989). op.cit, ch.4.)

In a **promotional approach,** programmes **involve local men and women in the planning stage** by assessing first what their health needs are and what their priority is, and how people would react to and participate in particular changes. Thereafter, it is decided what hygiene practices will be promoted and how. For some changes, it may for example be necessary to introduce special commodities, such as **safer water storage vessels or long-handled water dippers**, or see that these are locally available, or can be made by the women themselves. Further, promotional messages will have to be selected and suitable promotion material prepared. **The chosen messages, materials and products are then pre-tested,** to see whether they reach the intended groups and are understandable, acceptable and applicable for them. Only thereafter is the actual programme decided on and implemented.

A variation of this approach is **social marketing.** It makes use of commercial marketing concepts to bring about desired social changes and is **most useful** for a **single change** or product, such as oral rehydration for children with diarrhoea. (Corrales, G. et al. (1983). Control de enfermedades diarreticas: experiencia de un programa a nivel nacional en Honduras. Tecucigalpa, Honduras, Ministerio de Salud Publica, Green, Edward (1986). Diarrhoea and the social marketing of oral rehydration salts in Bangladesh. Social Science and Medicine, 23, 4, 357-366.). When studies show that the desired change or item is not accepted by the women concerned, steps are taken to make adoption more popular. Prices of hygiene items are cut, or the range of options expanded. Health and social benefits are clarified, access to materials improved or other means used to stimulate widespread adoption. Continuous evaluation helps determine how women react to the programme and where the marketing should be improved.

In the **participatory approach,** community groups or representatives **work with field workers** who are trained in working with people. Together, they identify local problems in water use and sanitation practices, and plan, implement and monitor improvements. In this process local hygiene risks are identified, their causes looked into, priorities set and a plan made to solve these problems with full involvement of the community. This approach is

especially **suitable for more comprehensive hygiene changes** than the adoption of a single practice or product, and is useful for strengthening problem-solving capacities in the groups or communities themselves, so that new problems are also more likely to be tackled and communities become less dependent on outside support.

a) Women as planners

In the planning of promotional and participatory hygiene programmes, **women** can play an important role. First they are **familiar with local conditions and practices** and can clarify what the reasons are behind particular customs and patterns of use. Second, women can help **identify** what their **main problems** are in health and hygiene, what the relative urgency of these problems is, and what they themselves could do to reduce and solve these problems. This helps in selecting priorities, defining objectives and selecting indicators which are easy to measure and monitor in order to follow progress and results. Third, **involving local women in planning hygiene** improvements allow better use of indigenous knowledge.There is a great deal of evidence that in all cultures, women through their daily experience and observation, have acquired basic and practical knowledge of environmental hygiene on which both promotional and participatory programmes can build.

> *In East and West Africa, discussions with women revealed how the filtering action of river-bed wells and the slow recharge of dug wells are recognised as being beneficial to water quality. Perceptions of contamination of water sources from human practices and also the safety of a closed water supply have been reported in studies in Sri Lanka, Swaziland, Botswana, India and Liberia. Other examples of indigenous knowledge are the lining of latrine pits with a basket of wicker work similar to the storage bins used for maize. The lining of these baskets is filled with a mixture of clay, water and broken anthills. This helps to avoid caving-in of latrines, and protects the pits from white ants. (DANIDA (1987). The Danida-financed rural water supply programme in Iringa, Mbeya and Ruvuma regions of Tanzania. Report prepared by a joint evaluation mission. Copenhagen, Danish International Development Agency.)*

The amount of knowledge women have, and the gaps and misunderstandings which exist, are more likely to become apparent in in-depth planning discussions with women than in the more common Knowledge, Attitudes and Practices (KAP) surveys. Such surveys are only useful if beliefs, attitudes and behaviour are not automatically categorised as "right" or "wrong", to be corrected by didactic teaching, but lead to educational programmes that reflect recognition of and respect for the local communities and their framework of perception. (White A.T. et al (1985). Research needs in community participation and health education. Paper presented at a regional consultation on research needs in community education and participation in drinking water supply and sanitation,WHO Regional Office for the Eastern Mediterranean, Amman, Jordan, 31 November – 4 December.)

A fourth reason for involving **women** in the planning of hygiene education programmes is their **familiarity with local health communication networks and opinion leaders.** In every community, there are traditional learning and communication systems through which all new information is guided and transmitted. Often, women are the controllers and purveyors of such systems in relation to water, sanitation and health. Knowledge on which channels to use and whom to select as local promoters or trainers can greatly contribute to the effectiveness of hygiene education programmes. (Roark, Paule (1980). Women in development: successful rural water supply projects and the concerns of women. Washington DC, USAID.)

> *In Mahaveli, Sri Lanka, decisions concerning health, sanitation and nutrition were mostly made by women. Family members and fellow villagers are the main sources of health information mentioned by village women in Dhaka district, Bangladesh. Women's networks and local midwives were found to be important channels of information in Egypt, Indonesia, Guatemala, Tanzania and the Philippines. Women's neighbourhood groups were found essential in the communication and adoption of new health practices in South Africa and Taiwan.*

And finally, a fifth reason to involve **women** as planners is the **knowledge** which women have **on the constraints** they face in participating in hygiene education activities and the culturally most appropriate ways to address these constraints. Commonly reported constraints include **lack of time** and **opportunities for hygiene education, cultural restrictions** on attendance, and lack of **relevance** of the **programme contents.**

Time to learn

A **first condition** for impact of **hygiene education programmes** is that they actually **reach those for whom they are intended.** Frequently, women have mentioned lack of time and opportunity to attend health education meetings, especially when held at inconvenient times or places.

> *In Jamaica, government health staff only worked during the day when the women were busy with their own work. In the evening, when they could attend meetings more easily, the health staff had gone home. Distance and lack of time to attend health education meetings were also reported for programmes in Benin and Zaire, Guinea Bissau, Burkina Faso, Senegal, Nigeria, India, Sri Lanka, Republic of Korea and Malaysia. An evaluation study in the Upper Region of Ghana found that only 16,7% of those reached by a health education programme on water use and hygiene were women, even though their involvement as managers and participants was one of the original recommendations in the development of the project.*
> *(Harkness, Rose Mary (1983). Village women, water and development: an evaluative study of the Upper Region Water Supply Project in Balagatonga District, Ghana. Ottawa, Canada, Carleton University.)*

Where women have obtained more time and opportunities to meet, or programmes are adapted to more suitable times and places, mothers' or health classes have been more successful. In a rural community in Sri Lanka, the public health inspector and community health volunteers failed to raise interest in follow-up to a community self-survey on health problems until the felt needs of the mothers (which included a children's day-care centre) were addressed. In Viet Nam, the provision of crèches has enabled women not only to take part in economic work outside their households, but also to participate in small group discussions on hygiene and family planning, and to support rural health centres. Their participation has been essential for the health movement as a whole; where they have not been mobilized, results have been poor.

Cultural restrictions

In cultures with segregation or **seclusion of women**, access to **health education** is even more **difficult.** Meetings at health centres are not appropriate because apart from time and sometimes transport, this requires entering the public sphere. The same cultural restrictions apply when village health workers are men, as experienced for example in Afghanistan. Several programmes have succeeded in reaching women more effectively at their meeting places. The **choice of site** will **depend** on local **socio-cultural circumstances.** In Nigeria, where women do most of the marketing, a health education programme was transferred temporarily from the health centre to a stall in the weekly market.

> *In a Guatemalan community, women gathered for several hours at the local 'pila' or communal washing place. After listing their health problems, a series of tape recordings was prepared using several techniques for knowledge transfer and behaviour change. The tape recorders were operated by a local girl. Methods used in the tape were dramatisation (the happenings in a local family), authoritative statements (from respected local health staff), reinforcement (reminders of earlier messages), localisation (interviews) and entertainment (music, stories). The design of the contents and the hours of operation were adapted to suit the variable times of visits to the laundry places. An evaluation showed that women appreciated in particular the health information. Scores on a health knowledge scale varied from 92% for daily listeners to 35% for those who said they do not listen actively. The knowledge score of a comparable control group who did not hear the tapes at all was 27%.*
> *(Colle, Royal and Fernandez de Colle, Susana (1978). The communication factor in health and nutrition programmes: a case study from Guatemala. Cojanus, 11, 3, 151-196.)*

Elsewhere, water collection places have been found to be suitable for small group discussions on water use and sanitation. In a **Tanzanian project, group discussions** were organized **at water collection sites** and in informal gatherings using locally made discussion posters made by local artists. In addition, members of the village water committees made home visits to discuss how sanitation could be improved. In **Moslem communities**, health **discussions** have been effectively organized at **family gatherings** and informal meetings in women's homes.

Radio, and in some cases **television, reach women at home** during their work and therefore have been advocated for education on health and hygiene , especially for women in remote rural areas and in more secluded cultures.

> *A health education experiment in six rural communities in Ecuador showed that women were reached more effectively by radio broadcasts, and men by film and slide shows and demonstrations. In three villages in Dhaka district, Bangladesh, women mentioned radio as the second source of health information (47%), after personal contacts with relatives and friends (65%). Information from medical staff was mentioned by only 9%.*
> *(Laubjerg, Kristian (1984). Bangladesh rural water supply and environmental sanitation programme. Socio-economic studies (Report no.2). Dhaka, UNICEF and DANIDA.)*

Conditions for effective use of radios are that women have access to functioning radios and that the broadcasting hours, vocabulary and programme content are adapted to their habits, life style, knowledge and beliefs. This happened for example in oral rehydration campaigns in Honduras and the Gambia. In a case in India, on the other hand, it was found that women did not have practical access to broadcasts because their husbands took the radios with them during the day. In Yemen, women did not listen to women-oriented health education programmes, because of inappropriate scheduling of broadcasts, unfamiliar vocabulary and inapplicability of information. (Holstein, Lies and Huraibi, Fatima (1979). Women and child care, Rada Integrated Development Project (Technical Note no.4). Sanaa, Ministry of Agriculture.)

Lack of relevance

A third **serious constraint** to participation voiced by women is the **lack of direct relevance of many health education programmes.** Low-income women in projects in India, Bangladesh, Nepal and the Philippines felt that time spent away from their families should contribute primarily to the family income. Both men and women in a survey in three villages in Dhaka district, Bangladesh, gave shortage of food as their main concern. Some hygiene education programmes advocate unrealistic changes, such as handwashing with soap when soap is not available or too expensive. Occasionally, programmes have been adapted to the circumstances and needs of women. For example, in Kerala, India, the Health Department changed its approach after evaluation meetings with women and began production activities until the women themselves expressed interest in health education. Similar, attention to the practical needs of women as part of or preceding health education programmes has been reported in projects in Indonesia, India, Pakistan, Cuba and Guatemala. (Wijk-Sijbesma, Christine van (1985). op. cit., p.19.)

In this connection, **women's organisations**, as well as local women, **should be consulted** and included actively **in planning and implementation of health education activities**, irrespective of whether these are carried out by mass media, through women's groups, or

through occasional campaigns. Social habits and traditional practices which are clearly adverse to women's health may nevertheless be part of cultural patterns which give a sense of identity and security in that particular society. The readiness to change such habits and practices cannot be imposed by specialists from without, but can only be encouraged by women from within the society. A strengthening of women's self- confidence and participation in the social and economic decisions of their society is necessary, as is the motivation of women to realise that they themselves can and must influence their own situation and conditions of life, if any change for the better is to occur.

b) Women as users

In the **implementation** of **hygiene** education **programmes**, women are the obvious **target groups**. However, thinking of women as a homogeneous audience can be as potentially dangerous to project success as not recognising sex differences at all. In many project-related communication activities, it is important to appreciate who is actually doing the household chores. Often, this may be the eldest daughter, as many lower-income women may work away from home, as domestic servants, as in many Latin American slum areas, or in agriculture in rural areas. Equally, communication activities need to take into account whether it is really the mother who looks after the young children all day, and therefore plays the major role in toilet training them and supervising them, or again the oldest girl, or the grandmother. Similarly, the influential role of any mothers-in-law, mothers or informal village or community leaders may need recognition. The latter may be both male leaders and female ones, such as traditional women leaders or midwives.

Another **shortcoming** of many hygiene education programmes is that **women** are **involved as the only, rather than main target group**. However, in many cases, cultural divisions of labour and responsibilities do not permit women to make decisions or carry out improvements in all aspects of hygiene. In many cultures, financial decisions on the installation of hygiene-improving facilities, for example, are taken by men rather than women. Without proper education, men may think these items luxuries to save time and efforts rather than means for improved health for the whole family. Men may also be needed for practical help in installation or maintenance of certain hygiene improvements.

> *In West and East Africa, latrine construction and kitchen improvements are often carried out by women. But essential building activities, such as pit digging, or roofing, which is important to prevent non-use and collapse of clay slabs in the rainy season, are men's tasks, as also pointed out by the women themselves.*
> *(Wijk-Sijbesma, Christine van (1985). op. cit., p.19.)*

Exclusion of husbands and fathers from hygiene education programmes also does not take into account their feelings of responsibility and pride in their family and children, and limits opportunities to gain their support. (Burgers, Lizette et al (1988). op.cit.,p.19.)

c) **Women as trainers**

In programmes where women are the primary focus, women themselves have been found to be the most effective promoters of health and hygiene and trainers of other women. Women workers generally understand more intuitively the problems and issues faced by other women and can communicate more openly with other women. Many communities have, for example, trained village health workers, who often are women. Experience shows that mature women in particular, are stable and effective communicators and motivators of health improvements. Technical projects can benefit greatly from close cooperation with these women.

Where there are no village health workers, local women have often been trained for educational and motivational tasks, for example, in water and sanitation projects in Nigeria, Pakistan, Guinea Bissau and Ghana. There are indications that the communities and the women themselves would like some curative and technical tasks to be added, both to serve wider community needs and to enhance community payment. An example are the Thai health workers, both men and women, who receive training in latrine making and water storage tank construction. To reach families more effectively, several Asian countries, including Viet Nam, Thailand and Japan, have also selected individuals, often women, from small groups of households and trained them on environmental sanitation, to assist community health workers in promoting improved hygiene.

In the **selection of training candidates** it has been found that selection **by the women themselves** is usually **more effective than appointment** or selection **by others.**

> *In Ulengule village, Tanzania, women were asked to select the women they considered to be most suitable for training as environmental health educators. Evaluation showed that they had chosen those who were already opinion leaders in health and domestic care. Criteria used were so subtle that the project could not have made the same choice. These women were very effective motivators of environmental changes in those subjects areas which are the responsibility of women. (Tanzania, Republic of (1983). Water master plans for Iringa, Ruvuma and Mbeya regions. Socio-economic studies: village participation in water and health. Vol.13. Dar es Salaam, Ministry of Water and Energy.) It is interesting to compare these experiences with those with piped water supply projects in two communities in Guatemala. The health communicators (men and women) selected by the (male) water committee made little or no impact. This is presumably because the young women were probably selected by the committee for their knowledge of Spanish, and not for a role in the community's informal health network".*
> *(Buckles, Patricia (1980). The introduction of potable water and latrines, a case study of two rural communities in Guatemala. In Elmendorf, Mary (ed.). Seven case studies of rural and urban fringe areas in Latin America. Washington, World Bank.)*

In addition to being involved as trainers of other women, women are also participating increasingly in the organizational approach to health education. As members of village

health or water committees, women are, for example, involved in the planning and implementation of hygiene improvement programmes in their communities. This may include the identification of local hazards by simple community surveys, as has been the case in projects in Malawi, Togo, Burma, Thailand, Sri Lanka and Indonesia.

2.2 *Organizing community hygiene education programmes*

There are several ways to **strengthen the link between health education and technical** water supply and sanitation **projects.** (Boot, Marieke (forthcoming). Key issues in hygiene education planning and management. The Hague, DGIS/IRC.) The most simple **option** is that the **project** directly **employs staff** to cover this component. In this set-up, an education coordinator comes under the project manager, whereas field staff responsible for the education activities either come under the education coordinator or under the project engineer. **Advantages** are that the lines of command are clear and that **planning, communication and coordination** between technical and education staff **can be organized** more **easily**, because all staff are part of the same project under the same manager.

A **disadvantage** is that the number of directly employed **staff** will necessarily be **limited** to one or a few persons, mainly **for budget reasons.** This will make it more difficult to establish good rapport with the communities and to provide for continuity in the hygiene education activities.

A second **option** is that hygiene education **staff** are **seconded** to the project **by the Ministry of Health.** The **advantages** are the same as for the first option. Additional advantages are that there will more likely be a **link** between the **project activities** and activities organized through the **regular health services** and that the education staff may get supervision and backstopping from the health department. The disadvantages of the first option about the problem of the active involvement of community level hygiene promoters and the continuity of hygiene education activities will remain the same for this option. Another **disadvantage** is that the project **does not control the selection procedure** of the **person**(s) to be seconded, and thus is dependent on the choice of the health department which may not take into account sufficiently the needs of the project for a particular person or persons. Staff replacement will also be largely out of control of the project.

A third **option** is to have the hygiene education component covered through health workers of the **regular health services** in the area. This requires **coordination** between the **water department** and the **health department**, for example through a coordinating body. The **clear advantage** of this option is that the **existing health infrastructure can be used,** and thus that the integration of a hygiene education component can be used, and the integration of a hygiene education component can be built on the use of trained health staff spread over the area. A precondition is of course that the health services are established down to a level reaching large population groups.

Integrating hygiene education through the existing health services is often cheaper, as less human resources costs are involved. It also provides more opportunities for continuous and close relationships with local population groups through which hygiene education usually is more effective. Another advantage is that confusion will be prevented as the hygiene education in the framework of the water and sanitation improvement will be carried out by the same health workers as those who visit the communities for other health services. A possible disadvantage is that the matching of technical and educational activities is more difficult to organize and that communication between technical and health staff needs more attention and may cause more frustrations. Also, there may be rivalry between the water department and the health department, hampering a smooth running of activities. One of the common problems is that a water department has more influence, more funds, and more visual results. A health department may feel or be weaker and therefore be in a disadvantaged position. However, also the opposite may be true. A health department may very much welcome the opportunity to contribute to water and sanitation improvements as it will provide more possibilities to carry out their regular tasks with more tangible results and usually with extra resources for transport and materials.

A fourth **option** combines option two and three in a **mixed organizational set-up.** It is meant to overcome the problem of **effective cooperation** between the **water department** and the **health department** at the **implementation level** by seconding health staff to water and sanitation projects, and **technical staff to health projects.** The latter is especially useful when the water and sanitation activities concern improvements to traditional water and sanitation systems for larger coverage within the same budgets, as discussed in Module I.

In addition to integrating hygiene education through the health department, there may be other departments that may provide valuable opportunities for cooperation and coordination. For example, in a number of countries there are departments for rural integrated development, social (community) development or a special department for women development. The organizational set up may be the same as for cooperation and coordination with the health department.

And finally, a fifth possibility is to **invite a non-governmental organization** to take responsibility for the integration of a hygiene education component. Especially somewhat larger NGOs with sufficient field staff may be in the position to carry out effective hygiene education within the framework of a water supply and sanitation project. Reasons are that NGO field staff usually are very committed to working with especially the poor sections of a community; are experienced in working through a participatory approach; and have long-term relationships with the communities continuing over time.

If a NGO is involved, it is often done by contracting out the hygiene education component to the NGO. An **advantage** for the project is that it is **easy to manage**, as the responsibility for hygiene education is just handed over to the NGO. **Disadvantages** are that the **NGO may lack authority to influence technical staff** with respect to the planning, implementation and maintenance of water supply and sanitation activities and that the NGO may have to discontinue its hygiene education activities once the project is over, when it has no own funds to continue the work.

2.3 *Role of women's organizations*

Women's organizations can play a **substantial role** in helping rural and low-income urban communities improve local hygiene conditions and practices. As discussed in Modules I and II they can do this as part of an ongoing water supply or sanitation programme or through separate community self-improvement projects.

In working with women's groups and organisations, **two basic approaches** can be distinguished: those that **aim at the development of individual knowledge and skills, and** those that aim at **development of analytical capacities and group building. In skills-oriented type** of programmes, **women are trained in skills** and competencies by which they can **improve their lives** and those of their **families.** The training offered usually includes child care, domestic hygiene and nutrition, but may also include technical skills based on local resources, such as the construction of household water filters and latrines.

Analytical types of programmes encourage **women to assess local problems,** to generate ideas for solutions, and to work out their own action plans using as much local resources as possible. In this process, the **women work as a group** rather than as individuals. As a result, problems more fundamental than hygiene and sanitation may emerge for group action.

> *The Navamaga training programme of the Women's Bureau of Sri Lanka, is an example of this training. First 90 male and female "trainers of trainers" were identified and given a course on why to involve women in development, and how to help women's groups analyze local conditions and start local improvement projects. Each of the trainers then trained local women leaders in three villages in their area and helped them in implementing the identified projects.*
> *(Svendsen Seslar and Wijetilleke, Sujatta (1983). Navamaga, training activities for group building, health and income generation. Sri Lanka, Women's Bureau and Overseas Education Fund.)*

The involvement of **women's organisations** in this type of **training** has many advantages:

- women's organisations are traditionally **health-oriented;**
- they provide a **channel** for women-to-women **communications;**
- they provide a **forum** for legitimising and popularising changes in behaviour concerning water and sanitation.

At the **national level,** women's organisations can:

- **link up with national women's development programmes** by including water and sanitation topics in women's literacy campaigns and in women's health programmes;
- **identify women leaders** to promote clean water and sanitation;

- **organize or support research** on women's questions in water and sanitation such as: are there sex-differentials in deaths due to related diseases, in disease incidence or prevalence, and do women participate in the planning, execution and management of local hygiene programmes?
- **conduct surveys** of places where women are employed, to check sanitation conditions. Is safe drinking water available? Is water available for washing? Are there toilet facilities?
- **convene groups of women** for health education sessions with primary health care workers, to discuss and demonstrate:
  - how to use community and domestic facilities,
  - water conservation and sanitary transport and storage,
  - reasons for washing hands, protecting food, cleaning clothes and utensils,
  - recognising and treating diarrhoeal diseases in children,
  - breast-feeding and child care practices.

As already discussed, care must however be taken to assess whether education and training activities exclude especially the poorer sections of women, and whether training and learning methods applied are top-down and removed from participants' life-realities.

3. *TRAINING ACTIVITIES IN WATER SUPPLY AND SANITATION PROJECTS AND PROGRAMMES*

One of the most important lessons learnt in the water sector is the need for an inter-sectoral and inter-disciplinary approach to WSS issues. Education and training needs for WSS cannot be considered independently from other needs, since the most valuable asset and natural resources of any nation is its people.

In the **New Delhi Statement** one of the four guiding principles focus on "a reorientation of institutional strategies to ensure an integrated approach, including educational aspects, a change in attitudes, behaviour and procedures, and participation of women at all levels of sector institutions".

Training must be carefully planned in order to ensure that trainers, both men and women, are actually able to use their newly-acquired skills within the water sector. The objective for training programmes must be the productive employment and engagement of the trainees and not simply the completion of another training course. More careful monitoring and follow-up of participants should be carried out. While human resource development activities are often expensive investments, careful planning should also lead to large return in terms of improved productivity, efficiency and safety.

The participation of women in the field of water could be greatly increased through education, training and participation in WSS projects. Information is not available on the number of women that receive such education and training in developing countries because information is not disaggregated by gender. Generally, women have lagged behind men in education in science and technology.

Not only are there few women in WSS-related fields, but most training programmes and orientation on WSS and development only peripherically touch women. International aid programmes and experimental projects generally bypass women, despite evidence that training women constitutes the critical difference between successful and unsuccessful programmes in community WSS projects. **Very few WSS projects include the following checklists which is a prerequisite for successful projects in the rural areas.**

- Will women receive training in the operation and maintenance of equipment?
- Will women be informed of the supplies required and the names of suppliers of parts and equipment?
- Will women receive instruction on procedures and regulations covering access to sources of water and/or the operation of equipment, if applicable?
- Will women be trained in the actual construction, operation and/or long-term maintenance of the WSS system?
- Will there be support for the training and assistance of local women in the sector or project-related activities?

The availability of disaggregated information on the training and employment of women in water-related fields would enable planners and decision-makers not only to formulate better strategies for water supply and sanitation, but also to identify problem areas involving women that required immediate action, taking into account priorities and pertinent socio-economic factors in each country.

3.1 Prototype guidelines for the preparation, implementation and evaluation of training components for national organizations

Today, it has been recognised that **human resources development is essential to successful project implementation in all sectors.** This prototype guidelines are intended to assist in the development of training components in organizations dealing with WSS projects at national and regional levels, and to provide a framework within which development planners, project staff, officials in developing countries are operating.

Analysis of human resources and training needs in the water sector is a complex undertaking, since it involves not only the supply of trained human resources for a given utility, but also an analysis of an overall WSS and rural development plan as well as an analysis of the national and international sources from which such training may be available.

During the identification and preparation stages of an WSS project, an in-depth study can ascertain the necessity for a training component. Early identification of needs for particular skill levels, and examination of previous projects will provide a sound basis for training components.

Identification of human resource and training needs

If analysis of the various technical, administrative and economic factors affecting the country's WSS sector determines that the amount of available human resources may hinder project implementation, the project management should agree to conduct an assessment of project personnel and training needs. It is essential to ensure that the involvement of women at various managerial levels and areas of work to reach consensus at the earliest stages of the objectives of the project.

Training needs should determine whether or not to undertake training action. Without an assessment of needs, training can become detached from real needs with the consequence that the training programme will not achieve the desired objective.

The following surveys would provide a sound basis of a proposal for a training component of an WSS project. In cases in which experience has shown that a less comprehensive approach would be sufficient, the work may of course be considerably reduced.

a) **Survey of project personnel structure.** The organization's training chart should be reviewed in the context of women's involvement in training needs and objectives. All current and proposed reorganization/procedural changes must be taken into account when developing the training component.

b) **Projections of human resource requirements should be made.** The projections should take into account human resource needs, particularly women's, related to the project.

Identification of existing national training capacity

In order to design the most cost-effective training component, a thorough inventory of potential sources of training in the local and national contexts must be undertaken.

Internal sources of training should be analyzed. The role of the training staff should be examined. Analysis should concentrate on responsibilities, functions of the project personnel, budget, training programme, relations with project manager, and physical facilities such as workshops, overhead projection, slide projection, etc.

External Sources of Training. A country often has national institutions providing sources of professional and skilled human resources and these institutions can be utilised in the proposed training programme. However, the quality level of these institutions should also be considered, and strengthened whenever needed.

Identification of a training component. Based on the above, a training programme can be worked out more precisely, determining unfilled training needs and necessity of eliminating weak areas by upgrading both men and women alike.

3.2 Preparation of the training programme

A training programme is made up of elements which interact to produce a given pre-determined result. There are various approaches to preparing a training programme, but in a **cybernetic form** a programme comprises: **an input** (the untrained person); **a process** (that enables a person to acquire knowledge skills and techniques); an **output** (the trained person); and **feedback** (to activate monitoring, control and improvement of the training programme).

Once training needs have been identified , a training programme should be prepared. Decisions on the adoption of a training programme and the type of scheme to be employed should be determined through cost-benefit and cost-effectiveness techniques.

The training proposal must outline a detailed process (Fig. WIII–1) for each component, including:

- objectives and priorities of the programme;
- type of training required and its duration;
- location of the proposed training;
- technical assistance requirements;
- estimated number of trainees by category;
- estimated costs: and
- evaluation and monitoring of the programme.

Fig. WIII–2 shows in detail the basic steps in a systematic training process. (See Additional Reading-Part I.)

The proposal should outline the goals of the programme, the time period covered and the expected general outcome. It must also identify the priorities of the training component, taking into account such factors as:

- prerequisite;
- cost;
- socio-economic and cultural setting:
- the urgency with which trained personnel is needed;
- availability of qualified instructors; and
- available equipment.

Fig. WIII–1
SYSTEMS APPROACH TO A TRAINING PROCESS

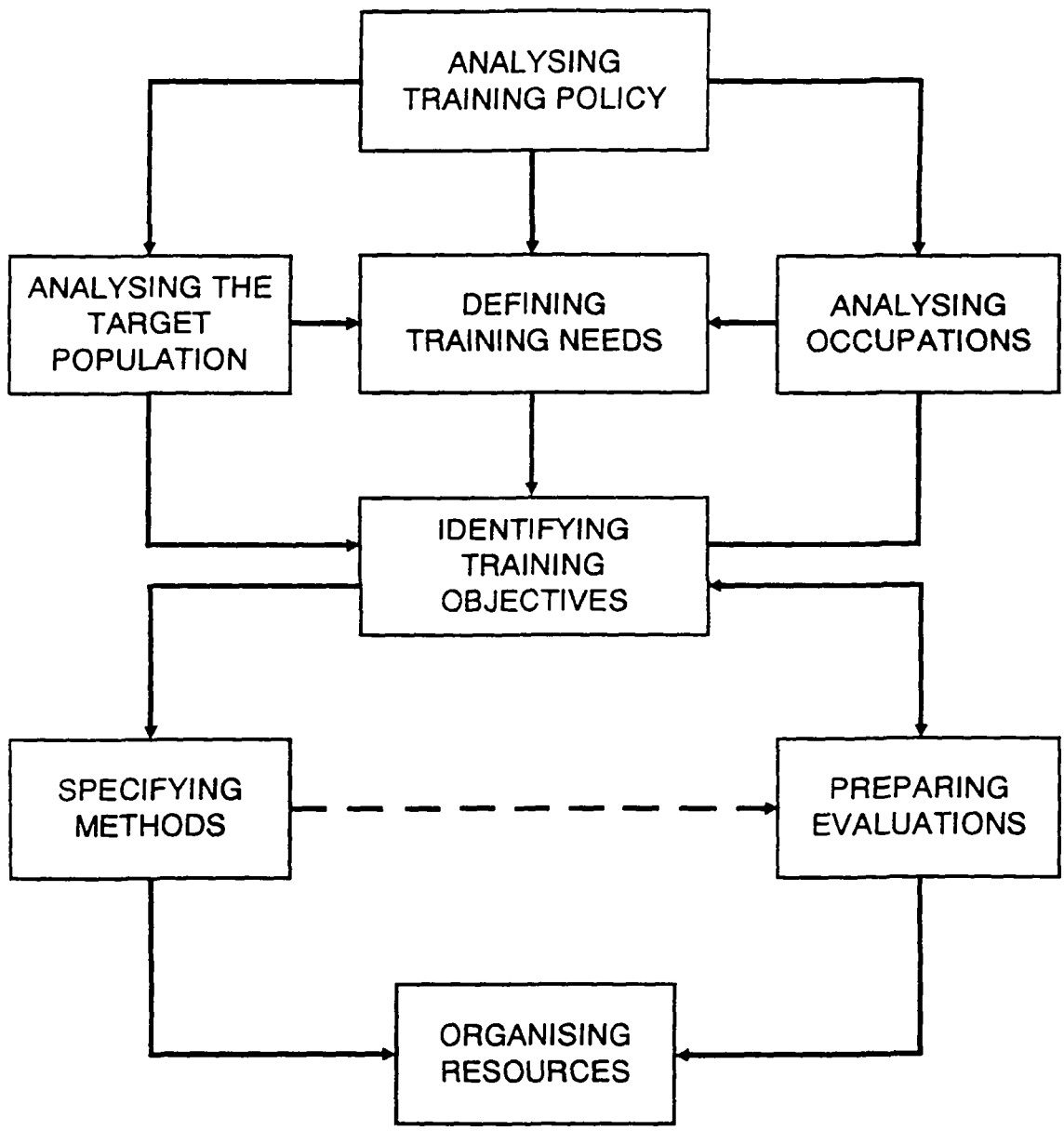

Fig. WIII–2
SYSTEMATIC TRAINING IN TEN STEPS

1. IDENTIFY THE TRAINING NEEDS AND PRIORITIES
2. EXAMINE THE OCCUPATION CHOSEN AS PRIORITY
3. ANALYSE THE OCCUPATION
4. SPECIFY, SELECT AND APPRAISE THE PEOPLE TO BE TRAINED
5. SET THE TRAINING OBJECTIVES
6. DRAW UP A SYLLABUS
7. PLAN THE TRAINING PROGRAMME
8. IMPLEMENT THE TRAINING PROGRAMME
9. CHECK THE TRAINING
10. FOLLOW UP THE TRAINING

The type of training required. Several types of human resources training are the subject of project components:

- orientation training for **newly-recruited staff** (particularly women);
- **in-service training** to improve efficiency and quality of present staff performance;
- training personnel for **development projects;**
- **training of trainers** to implement the scheme. (This aspect is vital for the successful implementation of a training component).

Location of proposed training programme. Training can be carried out either at the job site or away from it:

- **On-the-job training** is provided at the actual workplace itself. Particularly in the WSS sector, this type of training does not consist merely of passive exposure to various work-related situations as they arise, but rather is a method in which training is planned, programmed, organised in detail, and supervised.
- **Off-the-job training** is provided away from the trainee's actual workplace.
- **In-house training.** This can be carried out within the utility, in ad-hoc classes or in a training centre. Instructors should maintain contact with staff in operational areas, and give consideration to their systematic rotation.

Component cost. Cost estimates for the component should cover every item proposed. A general break-down of these categories might include:

- training seminars (including personnel, teaching expenses, per-diem allowance, transportation costs, electricity, paper, etc.)
- equipment and materials (such as teaching materials, audiovisual aids, printing equipment, etc.)

Co-financing of human resource training components by other international and bilateral aid agencies is becoming increasingly common in project work. Possible areas of collaboration should be explored at this stage, and indicated in the training proposal.

Evaluation of training

Everyone plays a role in the evaluation of training programmes. Therefore, it is important to understand how an evaluation is planned, conducted and reported. Various methodologies have been established for different forms of evaluation. However, each methodology has two distinct phases:

- the evaluation of the training process (**internal efficiency of training**); and
- the evaluation of results or the impact of training on the acceptance level (**external efficiency**).

The evaluation should take into account the following:

- **the participants;**
- **what will be evaluated;**
- **how, where and what data will be collected;**
- **how will data be verified;**
- **how will findings be analysed and reported.**

Plans for future training actions can be formed on the basis of the conclusions obtained from this evaluation. Collection of evaluation data has not been extensive in the past. Through review of such results (the "lessons learned" from project implementation), more precise criteria for evaluation can be established and research towards this should be encourage.

Conclusions

This general guideline provides a framework for project staff and development planners who can design, implement, monitor and evaluate human resource training components for WSS projects. Human resource training in the WSS sector cannot be regarded as an isolated function; therefore all the training components have to take into account socio-economic, cultural, technical and financial issues of WSS plans and policies at national and community levels. Men and women should equally be included in all training components, while projects and training aimed at community level should focus more on women as primary users of various water technologies.

4. GENERAL GUIDELINES AND ACTIVITIES FOR TRAINING WOMEN IN WSS PROJECTS

Introduction

Increased know-how for women in developing countries has been one of the major priorities of the **UN Decade for Women**. One of the most critically important factors affecting women's status is inadequate or non-existent education and training.

Know-how is acquired through three principal channels, namely:

a) formal education;

b) on-the-job training; and

c) non-formal education such as adult training classes.

Women in developing countries have been neglected in all three areas. In recognition of this, many developing countries governments have made major efforts to reorganise their educational and training systems both to reduce the gap in female literacy and to draw more women into scientific and technical fields.

The importance of promoting **training** for **women** in the field of **WSS** must be firmly emphasised. Special efforts need to be made to **identify women's needs and potential**, and to **train them** accordingly, particularly in **technical and managerial skills** regarding project development, and **operation and maintenance.**

Women should also be encouraged to **be trained as engineers, scientific research workers, water planners, programmers, distribution managers,** *etc.* Participation of women in post-graduate studies and further specialisation should be encouraged.

Assessment and planning of training should be carried out in view of needs assessment which would include women's needs. The participation of women should be encouraged in assessing skills and in planning the training programmes for WSS. **Training methodologies** should be applicable to the situation in developing countries. In this respect, the following methodologies and approaches **should include** the problematique of WSS:

- **training in situ (training of women in maintaining and operating the new systems and technologies);**
- **training of trainers (women have to be trained to be able to train others);**
- **modular approach (an entry level for women should be included);**
- **learner-centred methods should be applied in order to secure full participation of all women concerned;**
- **mass media and modern equipments should be used as far as feasible;**
- **traditional women's role as trainer within the family and local community context should be appreciated and enhanced;**
- **training of extension workers for specific matters related to WSS would be most useful for the process of integration of women in the use and development of water supply and sanitation facilities.**

The training activities applied at the national level should:

- **support training for women's participation** at national and local levels;
- **respond to women's requests** for training activities on WSS and provide short-term advice to various communities;
- **review education and training materials;**
- **grant fellowships and arrange visits to successful projects.**

4.1 Training women for local maintenance and management

A weak element in many **water supply and sanitation programmes is the training for** community members, **particularly women, for local maintenance and management of improved water and sanitation facilities.** This is probably due to the relatively recent change from centralised, agency-managed systems to more decentralised, participatory approaches, and also to the limited number of evaluations on the functioning and use of local facilities. Also, in recruitment and training of higher level staff, technical agencies involved in community water supply and sanitation projects still often emphasise technical skills, and pay less attention to management and socio-organisational aspects. The adaptation of training courses for programme managers and engineers and the introduction of training courses for community workers provide good opportunities to introduce the involvement of women as one of the factors from which both projects and communities can benefit.

4.2 Women as caretakers and mechanics

Training of women in maintenance has occurred mostly for handpumps and latrines. Training women for handpump maintenance has started in large programmes in, among others, Guinea Bissau, Malawi, Mali, Sierra Leone, Kenya, Togo and Tanzania. (Wijk-Sijbesma, Christine van (1985). op.cit. p. 69–70.)

> *Lesotho has many female caretakers because of labour migration of the men. In Sudan, when male caretakers were found to be often absent on their farms, they were replaced by females. In the Sudanese Kadugli district in Southern Kordofan, village women are being taught how to repair and maintain India Mark II pumps. (INSTRAW (1988). Women, water supply and sanitation, a national training seminar. Kadugli, Sudan, 16-21 January.)*

Strong efforts are also being made by UNICEF Morocco to involve women in maintenance. Water and sanitation are part of women's development programmes in Bangladesh and Guyana, and also feature strongly in Sri Lanka and Indonesia. (UNICEF, Annual report 1988: Water and Sanitation. UNICEF, New York, WET section.) In Karnataka, India, out of the 8000 handpump caretakers trained, over 5000 are women. (DANIDA, 1988. Report of the workshop for Danida Advisers on Handpump Maintenance systems in Danida-supported projects in India. Bhopal, August 6–12.) In Western Province, Kenya, training of handpump mechanics in a FINIDA-supported handpump project was halted in favour of training female caretakers, because of migration of mechanics to town after training and dissatisfaction over performance. (Kefinco, 1987, Kenya-Finland rural water supply development project in Western Province of Kenya. Ministry of Water Development, Kenya, and Ministry for Foreign Affairs, Finland.) A first group of 100 women was trained

in Dodoto in Ethiopia for maintenance and management of piped gravity systems and gained on-the-job experience during construction in 48 villages. (Wolde Emanuel, Y (1984). The drinking water supply situation in Africa and the role of women. Paper presented at the International Seminar on Women and the International Drinking Water Supply and Sanitation Decade, Cairo, Egypt, 12–16 March.)

In some programmes, **training of women on maintenance of handpumps** or piped water systems is limited to making an early diagnosis and reporting of problems, supervising proper operation and use, and preserving environmental hygiene. The effectiveness of this system depends not only on their own performance, but also on the support they get from higher levels: from local water committees, from government maintenance staff in centrally managed systems, or from local mechanics and water management organizations in community-managed systems.

In other programmes, **women are trained** not only for diagnosis and hygiene, but also for **preventive maintenance and simple repairs.** This includes greasing of moving parts, fastening nuts and bolts, repairing slabs, repairing broken parts etc. This occurs, among others, in Malawi, Kenya, Tanzania, Togo and southern Guinea Bissau.

The latter saves considerable costs to the executing agency, especially for transport. Women in Malawi and Tanzania get a special spanner or spanners to fasten nuts and bolts, but there is evidence that provision of tools is only useful when linked with the right task description, training and supervision, e.g. by the village water committee. Without such inputs, no differences were found regarding the percentage of fastened nuts and bolts in Madya Pradesh, India, between caretakers with and without tools. (DANIDA (1988) Report of the workshop for Danida advisors on handpump maintenance systems. Bophal, India, August 6–12.)

There are also some cases of training women mechanics in handpump installation and repairs. In Sri Lanka, local women manufacture IDRC-supported handpumps as part of an income-generating project. Others train village women on how to maintain and install the pumps in their villages. (Wanigasundara, Mallika (1985). Women of the pump. IDRC reports, October, p.24–25.) In Tharu tribal scheme, in Uttar Pradesh, India, a female superintending engineer of the state water organization started a pilot training programme for women mechanics after attending a regional training seminar on women, water and sanitation organized by INSTRAW and ESCAP. (INSTRAW, 1989. Regional training seminar on women's contribution to the International Drinking water supply and sanitation decade. Bangkok, Thailand, 23–27 January, International Research and Training Institute for the Advancement of Women, and the Economic and Social Commission for Asia and the Pacific.)

The women are trained for one month in installation and maintenance of India Mark-II handpumps. They get a fixed remuneration from the state water authority for each repair carried out by them and can further work as private mechanics in their community. The agency thus expects to reduce transport costs for maintenance at equal or better effectiveness.
(Sharma, Hima (1989). Now women of Tharu Scheduled Tribe ensure drinking water through India Mark-II handpumps. Lucknow, India, Jal Nigam, Uttar Pradesh.)

Introduction of open-top cylinder handpumps now under testing may further expand possibilities for women maintaining and repairing handpumps in their own villages.

Training of female mechanics also takes place in Sudan, where they now maintain 80 handpumps in the urban district of Kadugli. Women were chosen for training because they can better educate other women on proper pump- and water use, are more sensitive to pressure from fellow-women to do a good job, and can solve problems about pump use more easily. While husbands do not like married wives to be trained, most unmarried women continue the work after their marriage with their husband's consent. A surtax on sugar goes to pay the women's salary, spares and tools. (INSTRAW and UNICEF (1988). op.cit.)

In Sri Lanka, the Lasallian Community Education Service (LCES) trains 10–15 year-old school dropouts in low-income urban areas, both boys and girls, in basic plumbing and masonry skills and makes them part of teams that repair broken and leaking public standposts and washing slabs throughout their own neighbourhoods. Education for LCES means learning life skills, for example, how to contact government officials; how to repair leaky standposts; how to prepare nutritious meals; how to do simple arithmetics; how to sew; how to do simple carpentry; how to read. Perhaps the most important life-learning skill is also the most difficult to impart, that is the understanding that individuals and groups can make effective changes in the community, but can also be responsible for doing so. (Flanagan, Donna (1988). Human resources development in water and sanitation programmes. Case studies from Togo, Sri Lanka, Philippines, Zaire and Thailand. Training Series No 3, The Hague, IRC.)

4.3 Training women in latrine construction and maintenance

In sanitation projects, **particular attention should be given to training women as users, and managers of equipment, maintenance and hygiene.** Latrines which are not maintained properly become health hazards, rather than health promotors, in the spread of sanitation-related diseases. For sanitation services, **INSTRAW** (1986)."Training modules women, water supply and sanitation.", **recommended training of women** in the following areas:

- **adequate utilization and care of latrines** by the family members, particularly children;

- **proper disposal of faeces,** how to wash hands after defecating and before preparing or touching food;
- **recycling and reuse of waste water** and excreta where technically feasible;
- **adequate maintenance of sewage systems** by means of supervising services and timely conservation and repair;
- **inspection of domestic, regional and municipal systems,** contacting local authorities in charge of the public services as well as training other community members and the family itself;
- **development of income-generating activities** for use in sanitation improvement programmes;
- **carrying out of self-help activities** for sanitation improvements.

Apart from training for maintenance of latrine hygiene, which is a universal task of women, there are also areas where it is culturally appropriate to train women in latrine construction.

This is especially the case where women are already involved in traditional building activities, as in many parts of Africa, or are a member of the construction workforce, as in Central Asia. Training female latrine constructors is also beneficial where women live in seclusion, and can only be visited within the house by other women. And where women do not install latrines themselves, it is often useful to give them some technical information on proper installation techniques, such as the mixing and curing of cement. Because it is the women who are at home during the day, this allows them to closely follow and correct the quality of work, as happened in projects in Colombia, Sri Lanka and Karachi, Pakistan. (Wijk-Sijbesma, Christine van (1985). op.cit. p.33.) There is a growing number of examples of women being trained for latrine construction, e.g. in Lesotho, where the National Rural Sanitation Programme trains local craftsmen, 25% of which are women, in making ventilated improved pit latrines. (World Bank (1990). Rural sanitation in Lesotho, from pilot project to national program. World Bank and UNDP/PROWWESS.) In Kerala and Pakistan, female masons have been trained to build household latrines. Also in Thailand, Mozambique, Botswana and Tonga, training programmes exist which train women in latrine construction. (Idem, ibid, p.64.)

4.4 Training for managerial tasks

Women are often **informally involved in the local management of traditional water sources.** (Idem, ibid, p.25–28.) However, when an external project comes into the community and management becomes more formal, women are often **not included in the management system for an improved community water supply** or improved sanitation. In Module II it was already discussed how this can be prevented, by building in specific measures to obtain the support of local leaders and involving the women in local planning activities.

Training activities for local women form an important part of any measures to optimize the use of women's skills from traditional water supply and sanitation for the management of improved village systems. This includes activities for women as users, and for women as members of local management organizations concerned with community water supply, sanitation and hygiene.

a) Women as users

An improved water supply and sanitation project is an excellent opportunity to bring women together, often for the first time, around a theme of common interest.

This opens the **way for informal training activities**, in which modern adult education and participatory training techniques can be used to help women make **appropriate choices** concerning how they can best participate in the **local management of water supply** and **sanitation improvements**, who amongst them would be the most suitable candidates for doing so, what particular skills need upgrading, and what should be their responsibilities and rights (accountability) with regard to the functioning, use, maintenance and financing of the facilities.

Also the **health aspects** of improved water supply and sanitation, and the preservation of water resources and the prevention of pollution are important elements of such training programmes.

b) Women as members of water and sanitation committees

Nowadays, women are increasingly **members of community water committees**, health committees, village councils, water boards, and other types of local organizations holding managerial responsibilities for water, sanitation and hygiene. As such, they are usually **responsible for women-specific tasks,** such as health aspects, communication, and often also rate collection and financing.

However, training for women as users and as members of water committees is still little developed, possibly because community-managed systems in which communities are involved right from the start are a recent phenomenon. An inventory of training materials and programmes in Latin America, which has the longest tradition of community-managed water systems (25 years in some countries) shows that relatively little training for managerial tasks is taking place. **Particular gaps are the management and suspension of service connection,** financial management and control, employment and supervision of local operation and maintenance staff, linkage with sanitation and health education activities, and accounting for services to users/ratepayers. (Espejo, Norah (1989). Water committees in Latin America, tasks and training. The Hague, IRC.)

In Module II, it was already seen how cultural acceptability of home visits and a high trustworthiness determine that women are often chosen for tasks in local financing. Training

courses for financing and financial management should take this phenomenon into account, and be made more suitable for female participants with a lower education.

A number of water supply and sanitation programmes already include training activities for community management. In north-east Thailand, village leaders are trained on how to investigate community sanitation conditions, and how to establish and manage a village revolving fund to finance water supply and sanitation improvements. (Menaruchi, A. et al. (1985). Methodology for community-based sanitation development programme, including financial management. Bangkok, Thailand, Ministry of Health.) In southern Tanzania, water committees get some initial training in their villages, or at a local centre for adult education. (DANIDA (1987), op. cit.) In northern Tanzania, a special course was developed to train village water committees on financial planning and management. (Morogoro and Shinyanga Rural Water Supply and Sanitation Programmes (1989). Cost-recovery of village water supplies, a training guide for community development assistants.) A similar development took place in Tonga, Polynesia, leading to a much better financial performance of the local piped water schemes. (Finau, S. and Finau, S.A. (1983). Better accounting improves water supply. World Health Forum, 4, 169–171.)

The national rural water supply and sanitation programme of Honduras, SANAA, also gives some training in financial aspects to the water committee. (CIRR (1988). Report of technical assistance to the CRS project, Honduras. London, Catholic Institute for International Relations.) Agua del Pueblo, an NGO in Guatemala, organizes training for local water committee members in record keeping, basic accounts, planning, communication and leadership. (Agua del Pueblo (1986). Informe de progress de agua potable y saneamiento basico rural. Guatemala, Agua del Pueblo.) More comprehensive management training for water committees is reported from Chile. (Serani, M. pers. comm.) and in West Africa, from Burkina Faso (CIEH (1983). Le point d'eau au village. Ouagadougou, Comité Interafricain d'Etudes Hydrauliques.)

4.5 Training or learning to cope? The action-learning approach

Raising women's capacity to manage water supply, sanitation and environmental health is not to be underestimated. On the part of the community it requires acquisition of new skills and knowledge and the adoption of positive attitudes towards problem-solving and self-reliance. On the part of agencies it demands that they come up with innovative ways to guide and support the communities, rather than implementing all operation, maintenance and management themselves, as was the case historically.

Traditionally, most water supply and sanitation **agencies** are technical agencies, with little or **no experience in working with communities** in such a way that inherent development capacities are recognized, and new capacities built up. Nor can it be expected that just a few days' training on how to operate, maintain and repair a handpump or slow sand filter, or explaining the responsibilities of a water committee enables a community to manage water, sanitation and environmental hygiene largely on its own.

Rather, **a process of capacity building** has to take place throughout the **whole cycle** of the **project, in which both people and project staff work together to analyze problems, find appropriate solutions**, learn from mistakes, and use experiences and results to improve the whole project delivery system. (Korten, David. People-centered development. Connecticut, Kumarian Press.)

This process, also called the **"the learning process approach"**, uses training methods other than the conventional teaching approach to train community members on new maintenance and management skills. In the conventional approach, a lecturer or trainer tells or shows the participants what they should know and do, and why, and then examines whether the participants have acquired and retained the essential knowledge and are able to perform the required tasks. **"Action learning"**, the learning method focusing on **management capacity building**, is much **broader** and **more comprehensive** than conventional training courses, because it takes place on each occasion when analysis of conditions, planning and problem-solving occurs. The approach reaches much more people than the limited number of trainees communities can send to formal courses. Action-learning is named after its two main constituents:

- **action**, because this strategy causes people to examine their own actions in order to improve them; and
- **learning**, because the focus is not on training, but on starting a learning process which is replicable by community members themselves.

Action learning is needed because community management of water supply and sanitation is more than just taking over simple or simplified tasks assigned to village water or well committees. In the partnership approach, local management takes place in **all project phases** - initiation, construction, operation and maintenance, and involves decision-making, negotiation, problem- and conflict solving as well as more executive tasks during design, construction and management of maintenance. (Espejo, Norah (1990). op.cit.) Action-learning in water and sanitation projects may consist of the following activities.

During project preparation and planning:

- **participatory community diagnosis**, to identify and analyze problems and set priorities;
- **strategic planning** workshops, to establish a common vision and goals and set steps of action;
- **participatory meetings**, to exchange information, discuss options, and make well-considered and locally appropriate choices;
- **consultation on-the-job**, to select mutually appropriate designs and locations.

During implementation and maintenance stages:

- **problem-solving meetings,** to analyze how specific problems have come about and how they can be solved and avoided;
- **mapping and utilizing local resources,** which may include voluntary organizations,such as church and women's groups, community workers, traditional and modern communication networks, sources of educational materials, sources of finance and economics, local modern and traditional know-how, management and work organization, such as for community self-help;
- **on-the job** consultation and applied training for technical and managerial skills, in which e.g. particular maintenance and financing skills are acquired through learning-by-doing in a local setting;
- development of **community-based monitoring systems,** in which communities are involved to choose and record local indicators to monitor progress and record performance;
- **networking** with other communities, to exchange experiences and learn from one another.

During evaluation:

- **participatory evaluations,** to assess results, decide on remedial actions by community and/or agency, and give useful feedback to improve planning and implementation of water supply and sanitation projects.

However, similar to more conventional forms of training, special efforts and measures will be needed to ensure that women can effectively participate in such learning activities.

3.5 Facilitating women's involvement in training programmes

To ensure that women can be included in the training programmes of water supply and sanitation projects, **INSTRAW has recommended that more attention be paid to the following aspects: selection of women trainees, adaptation of training venues and materials, coordination with other training programmes, and support to trainees after training.**

a) Selection criteria for trainees

In addition to the general criteria for selection of trainees, **special provisions** should be made so that a certain percentage of **women are recruited.** For posts where some financial remuneration from the government is available, it is men who are usually selected as trainees. Whenever feasible, opportunities should be given to women.

Women chosen for managerial tasks should **represent the interest of the various socio-economic sections** in the communities and have sufficient time and mobility to carry out the work. Their position must be respected by both men and women. In practice, often single women are selected because of their greater freedom of movement. As socio-cultural patterns may vary considerably, the local women themselves often make the best choice of their representatives. Their participation is more readily accepted if responsibilities are divided along culturally accepted lines, for example, if women are responsible for health aspects, rate collection and communication with other women. Two women on a committee can give one another mutual support and attendance at the first meetings by an extension worker, who may need to be a women, is often helpful.

b) Adaptation of training venues

Short-term training will in most cases be **more desirable** for women's participation. **Training sites located** in the villages facilitate women trainees' attendance and provide opportunities for others to learn about the training itself and about its contents. Sometimes, simple child care facilities should be provided so that mother trainees can bring their young children with them, or assistance from other village women organized.

In segregated societies, local training events also make participation of women more feasible, especially when held at culturally appropriate places, with support from husbands and local leaders.

These approaches may be less appropriate in areas where women live in full seclusion and social contacts are confined to the families. In such cases, agencies, intermediaries or development workers have organised training sessions in the homes of leading local women and trained more mobile local women, often heads of households, as local promoters and crafts women.

c) Adaptation of training materials

Care should also be taken to ensure that **material** used for training is **suitable for women.** Women often have lower literacy levels, so may need a different style and wording, and more illustrations. Illustrations used should not only depict men, but also women of comparable appearance and lifestyle, so that female trainees have pictures they can identify themselves with, and the impression is prevented that training is a male prerogative. Pre-testing of especially hygiene education material is needed to uncover possible errors in conception and design, before costly investments are made in production and distribution of suitable copies.(See Additional Reading Part III.)

A recent WASH study of 54 visual teaching materials on water supply and sanitation found that only 19 had been pretested. Pre-testing of educational material with women has helped assess the degree of appeal of contents and presentation to them, as well as understandability, cultural acceptability and other requirements for effective use. (Karlin, Barry and Isely, Ray (1984). Development and using audio-visual materials in water supply and sanitation programmes. Technical report no.30. Arlington, Water and Sanitation for Health Project.)

The dearth of appropriate teaching and learning materials is a factor common to many countries. There is already available a wide variety of materials, including professional text books, visual and practical aids, as well as printed manuals which can be adapted by developing countries for their own use. However, **serious efforts** will be **required** to **prepare** and **disseminate** materials that are **linguistically and culturally suitable**, are cheap to produce, transport and use, and which from the standpoint of **content** are **oriented to technology and tasks** that **women will be expected to perform.** The local adaptation of existing materials should be encouraged. While such materials are needed for all levels of training, the needs of the lower-level women technicians and artisans require urgent attention. The role of training programmes to test and improve such materials should be fully explored. Equally, the process of constructing, operating and maintaining facilities should be used as opportunities not only for training but also for adaptation and upgrading of the training materials.

d) Co-ordination with other training programmes

In communities where there are trained health workers, every effort should be made to **promote collaborative activities** integrating water and sanitation components in the primary health care programme. At the community level, since many different outreach services aspire to benefit women and depend on women's active and responsible participation, it follows that institutional responsibility for training must be shared. While sharing the responsibility to implement training, however, precautions must be taken to ensure that it is conceptually integrated. Nothing could be more confusing to the recipients of services than to be approached by staff with conflicting philosophies and methodologies of field work.

e) Support for voluntary workers

Often men and women trained at the community level become voluntary workers. More women than men work as **volunteers** at the community level. The community might be mobilised **to support them either in cash or in kind,** or by exemption of obligatory labour. Sometimes if they are not paid in money or in kind, some recognition or appreciation shown to these voluntary workers will also be helpful. A rise in status can serve as an incentive for voluntary workers, as was noted in Togo where volunteer pump caretakers who were given positions on the village committee performed better and felt rewarded.

In an urban slum development project in Hyderabad, India, initially women made up 45% of the paid project staff. In 1981, their involvement was reduced to 23%, most being replaced by paid men. At the same time, women were essential to the project, because almost three-quarters of the households were Muslim. This resulted in an increase in the number of voluntary workers, 93% of which were women.
In other urban projects, local women, involved as intermediaries for sanitation, preventive health, basic education, and nutrition, have been employed increasingly by the departments concerned. In 1984 in Lima, Peru, 96% of community promoters and monitors were women, and many held leadership positions. In Ecuador, all programmes used women workers who were selected by their community, trained, and employed by the departments concerned. They were advised by user committees.

5. *TRAINING PROJECT STAFF ON WOMEN'S INVOLVEMENT IN WATER AND SANITATION PROJECTS*

Besides training women at the community level, **also project and programme staff will need some training** or orientation **on women's involvement.** Target groups distinguished are **project managers and policy makers, project field staff, and trainers of trainers.**

5.1 Orientation of managers and policy makers

For women's involvement to become an accepted part of all implementation and training programmes, the **support of programme managers and policy-makers is essential.** Often this requires the organization of specific orientation activities. In particular, more managers and policy makers need to become aware of the advantages of increased women's involvement for their own projects and programmes, and the implications this has for project procedures, for the selection, job descriptions, training and management of agency personnel, and for the cooperation with other organizations and services which can provide supplementary expertise.

The present training package is one of the mechanisms which have been developed to familiarize programme managers and training officials with advances made in the area of women's roles in water supply, sanitation and hygiene education. Information material designed for quick and concise orientation of higher level management, policy-makers and politicians is also increasingly available. Examples are the photo document on community participation and involvement of women published by GTZ (1989)." Sustainability and effective use: the case for community participation and hygiene education in water supply and sanitation.", the document published by the WHO for the New Delhi meeting (Elmendorf, Mary (1990). The IDWSSD and women's involvement. Steering Committee for Cooperative Action and WHO and UNP.), a number of films and video's such as the film "Prescription for health", produced and distributed by the International Development Research Centre, and various policy documents published by donor agencies. Many coun-

tries also organize their own workshops with presentations and case studies on women's involvement in water supply and sanitation projects.

Reasons and benefits

Ample information and documentation is by now available on the **reasons why women should be involved** in water and sanitation programmes and projects. Cases of actual benefits are increasingly well-documented, as are cases of project failures caused by, among other things, insufficient or unskillful involvement of women in the various stages of the project.

Programme Implications

The main **implications** of women's involvement **concern project formulation, human resources development and institutional development and linkages.** For example, most water and sanitation projects have as end goals, and as indicators for measuring these goals, physical, numerical and financial targets, such as "to install x schemes, handpumps or latrines for y number of people at z costs", or to provide x liters per capita per day for a design population of y people".

But in addition, these **projects** should also have **functional and behavioural objectives** and indicators, such as " to improve, within two years, water supply and sanitation conditions in area x in such a way that at least y% of its population has access to and are using, improved water supply and sanitation facilities consistently and in a hygienic way", and "to ensure that at least y% of the installed facilities are functioning reliably and adequately and are hygienically used by all throughout the year", whereby the concepts 'reliably' and 'adequately' are further defined and standards and methods for their measurement set.

Another characteristic of participatory programmes is that **from the start, projects** which aim at **actively involving local men and women** are **prepared as integrated** projects, **covering** both technical aspects and aspects of **community consultation**, training, maintenance, management and monitoring. Also the project document is a **multi-disciplinary** document, in which involvement of **women** is not simply an added paragraph, but is **part of all sections**: planning and design, implementation, human resources, training, monitoring and evaluation. This requires the use of **multi-disciplinary project teams,** in which all members are aware of and support women's involvement, and at least one member has specific experience and expertise in this area.

For human resources for community participation, and women's involvement, programme managers and policy makers have made various forms of arrangements. (IRC (1988). Community participation and women's involvement in water supply and sanitation projects. The Hague, IRC/DGIS/OECD, p.27.) In some programmes, the technical field staff is selected, monitored and promoted on the basis of combined technical, social and

communication qualities, and they are trained to work in a participatory way with local men and women.

This is, for example, the case in rural water supply programmes in Malawi and Guatemala. However, as these staff are mostly male, they often need additional training in involvement of local women, as discussed in the section below. The advantage of this option is that the **staff itself becomes mutidisciplinary** in experience and expertise and there are no extra human resource costs and need for coordination and cooperation with another department or agency for participation activities.

A second option is to have **special teams of male and female promotors** within the water or sanitation agency, as in several Latin American countries and in donor-supported projects in Africa. These teams carry out all socially related activities, such as organising men's and women's involvement in local planning and decision-making, finding a suitable organization for local maintenance and management, helping this organization to strengthen its managerial knowledge and skills concerning water, sanitation and hygiene, and monitoring community performance combined with backstopping (support activities), when required. Although the costs of this approach are higher, and long-term sustainability must be considered, the advantages are that experience is acquired within the technical department, and that cooperation and coordination are somewhat easier than when other departments or agencies are involved.

A third option, **cooperation with other departments or services**, either governmental or NGOs, makes use of already existing staff and expertise in community work in these agencies. This is obviously more cost-efficient than on organization employing its own social staff, but it puts greater demands on cooperation and coordination among the organizations. Often, these programmes also have other responsibilities and programmes, in which case long-term cooperation with the water or sanitation programme may be difficult.

However, in neither of these cases does the presence of social staff free technical agencies from the need to adapt their own procedures and working methods with communities, under the motto that "community participation and women's involvement are done by others". Meaningful involvement of community members, men as well as women, requires a different attitude and way of communication on the part of all project staff, irrespective of their backgrounds and specializations, and this requires adapted training, task descriptions and manpower management of all staff.

5.2 Training field staff – men and women

Training needs in participatory water supply and sanitation programmes at the field level are usually **two-fold**. The first concerns the **methodology of action learning**: how to work with local men and women in a participatory, action-oriented way so that a sense of responsibility and commitment is created and problem-solving continues after external support is reduced. A second training need concerns **the content knowledge** which field staff need, in order to communicate meaningfully with the communities and train them in the

specific knowledge or skills needed for local maintenance, management and hygiene improvements.

a) **Training in participatory methods and techniques**

Especially in the fields of adult education and extension science, **creative methods and techniques** have been developed to work in a **participatory way** with people and stimulate the building of local capacities, skills, leadership, confidence and self-esteem through action-learning processes. These methods and skills are increasingly being adapted for use in participatory water supply and sanitation programmes, and courses and manuals have been prepared for their application at field level. (Keehn, Martha (1982). Bridging the gap, a training guide for health staff on using a participatory approach in health and nutrition education programmes (Save the Children), Vella, Jane (1989). Learning to teach, a guide to organizing and implementing workshops to train field staff in participatory approaches to community development). Examples are the DELTA training course used to train coordinators of development groups and projects -including water and sanitation projects in Kenya (Hope, Anne and Timmel, Sally (1976). Handbook for Development, Education and Leadership Teams in Action (DELTA), and the SARAR methodology developed by the UNDP Project for the Promotion of the Roles of Women in Water and Environmental Sanitation. (Srinivasan, Lyra (1990). Tools for community participation: a manual for training trainers in participatory techniques PROWWESS/UNDP.)

In the SARAR methodology related to participatory water and sanitation projects, project field staff are trained how to use participatory methods and tools to stimulate the building of Self-esteem, Associative strength, Resourcefulness, Action planning and Responsibility for follow-up. Participants learn, among other things, to identify at what stage of awareness and readiness a community is at for undertaking problem-solving actions in water supply and sanitation. They also learn to define the characteristics of a good group process, to distinguish between different training and learning styles, and to use different types of tools and activities for different learning purposes.

To find out at what stage a group or village is at regarding felt needs for, and priority of, for example, a sanitation project, course participants sort out various statements on latrines, ranging from "Why do we need a latrine. We have always gone to the field", to "My family's health would benefit if we had a latrine. I am willing to build one and show others how to build theirs". While communities or groups of the first type still need open, problem-identification type of learning activities, communities, households and groups of the second type need much more practical training and support.

The training offers a large number of tools and exercises, which field staff can use to help communities assess needs, identify and analyze problems, plan and monitor change, absorb information, and build group and community capacities. It has been used

to train a wide range of staff in participatory methods, techniques and tools/activities, from health staff and other extension workers in Lesotho. (Sampson, W. (1987). A participatory approaches field manual. National Rural Sanitation Programme, Lesotho, Ministry of Health and Ministry of Interior, to social experts in engineering firms, and trainers and managers in engineering, health and community development programmes Training in community participation: report of an African regional workshop for programme staff, PROWWESS, 1989.)

b) Content-oriented training

Besides training in participatory methods, **field staff** of water and sanitation projects also usually **need specific content knowledge,** so that they can answer community questions, help make wise decisions, train community members in specific skills, etc. Examples of more content-oriented training subjects include:

- **how water and sanitation diseases are spread** in a community, and what men and women themselves can do to cut off local transmission routes;
- **basic aspects of water and sanitation technology** and its implications for location of facilities, service level, maintenance demands and implications for costs, source protection and hygiene practices;
- **cycles of water and waste,** and their implications for water resources management and environmental protection;
- **why it is necessary to involve women,** in what decisions and activities they need to be involved, what are common problems to overcome, and what are ways and means to do so;
- **possible local maintenance,** management and financing arrangements, and the advantages and disadvantages of each in different types of community settings;
- **simple systems of budgeting,** bookkeeping, accountability and financial control.

Because field staff in turn must use their knowledge in the action-learning process with communities, also the **methods** used to acquire the more content-oriented type of knowledge should **not** be **theoretical** and didactic, **but participatory and adapted to local cultures.** Games, role plays, story telling, group activities, participatory field activities can also play a role in content-oriented training.

Examples of more content-oriented training for water and sanitation field staff are:

- the francophone training course and materials for community motivators of the Comité Interafricain d'Etudes Hydrauliques in Burkina Faso (CIEH (1983). Manual de Formation des formateurs villageois. Ouagadougou, Centre Inter-état des Etudes Hydrauliques., covering technical, health and site management aspects);
- WHO's guidance material for training community motivators in a wide range of tasks throughout the project cycle (White, Alastair and Gordon, Gill (1987) Training community motivators in water supply and sanitation. WHO and IRC);

- a training guide and course plan to train community development workers on village financing systems for water supply maintenance and village sanitation (Morogoro and Shinyange Rural Water Supply Programmes (1989). op.cit.);
- a training guide for organizers and advisers of small and medium-size village organizations, written by a collective group of francophone African authors and based on the ACER model (Analysis, Conceptualization, Evaluation and Retroaction), covering among others, human resource management and financial aspects (Gestion Norsud (1989). La gestion des petites et moyennes organisations africaines. Manuel du formateur et du conseil leur en gestion. Montréal.);
- training and field materials (manuals, flipcharts, discussion posters) for field staff of water, health or social service departments to carry out group/community discussions on water, health and technology (Flannagan, Donna (1987). Community water supply, a manual for user education. Geneva, ILO/UNDP, Special Public Works Programme);
- training modules for participatory water supply, sanitation, drainage and solid waste improvements in low income urban and peri-urban settlements. (Habitat (1988) Community participation: a trainers manual. Nairobi, UN Centre for Human Settlements.)

Further it should be noted that while some courses pay specific attention to reasons and methods for involving women, no specific training course on women's involvement could be identified for field-level staff.

c) Whom to train – men, women, or both?

Although female field workers are obviously at an advantage when wanting to reach and involve women, **both male and female** staff should learn in a creative and participatory way about the relevance of women's active involvement in water, sanitation and hygiene improvement programmes, and should be assisted to identify constraints and solutions to women's involvement in the particular cultural setting. One reason is that male field staff must be able to do their own share of the work, e.g. in orienting local leaders and at meetings and trainings in which they are involved. Another reason is that contrary to expectations, male field staff with the right attitudes and skills have also been able to involve women in water and sanitation projects in a culturally acceptable way, e.g. by cooperating with local teachers, health workers or other women professionals in the community.

It is thus **necessary to train both male and female field staff** in special skills and techniques of women's involvement as part of any training on participatory approaches. Secondly, it is equally important to **make all content-type training** (technical, managerial, health education) **more gender-specific**, that is, taking into account that field staff can meet the specific requirements of capacity building with male and female community members.

5.3 Training of trainers

In order to reach women, it is often necessary to train women as trainers of other village women. In many cultures, women as both trainers and trainers of trainers are more effective and are sometimes required if females are being trained. The key is task-specific training, which includes information necessary for women to practise, teach and supervise others.

a) Adapting training programmes to field realities

The **critical shortage of women trainers** is a problem that most countries face. Plans for the development of such personnel should include: a) an estimate of trainers' requirements; b) the development of general training strategies and c) the formulation of plans for linking the teaching of training techniques to field experience in water, sanitation and hygiene education activities.

Women as trainers can range from graduates to illiterates, and among them there will be variations as to age, education, occupation, social background, etc. The types of tasks to be performed will determine the quantity and types of women to be trained.

The range of tasks is broad and includes various areas, such as:

- planning, programming, budgeting and evaluation;
- the design and construction of facilities;
- the operation and maintenance of facilities.

In most countries, the latter set of tasks requires immediate attention, so that both existing systems and those to be constructed will be properly operated. This will mean an intensive focus on the training women for intermediate and lower levels.

The training of women as trainers should be handled with caution, concentrating on under-served areas and people mainly in rural areas. More attention should be given to training women as trainers on the sites where facilities are being constructed, operated and maintained.

Training women as promoters and educators

Women themselves have been found to be the most effective promoters and educators in programmes where they are the primary focus. Women workers generally understand more intuitively the problems and issues faced by other women, and can communicate more openly with other women.

Strategies suggested to involve women in WSS projects include:

- integration of women in general community participation procedures;
- adapting existing participatory activities of women to WSS activities;
- establishing separate organisations for women's participation linked to those of men;
- strengthening existing forms of women's involvement;
- and of course any combination of these.

In all cases, programmes can benefit by using a **"learning-by-doing" approach** whereby field staff are invited to discuss experiences periodically, and intermediate evaluations are carried out to adapt ongoing programmes. Integration of the findings of this process in field manuals and training for community participation and education will help to ensure that knowledge thus developed is invested and used by organisations rather than individual workers. Reporting on meetings, and evaluations and exchange of manuals will facilitate the sharing of knowledge between agencies and countries. In addition, there is a need to update existing manuals for field work and training in community participation and education for new water technologies. At present, many of these do not pay specific attention to the involvement of women in the various phases of local projects.

Also, in recruitment and training of higher-level staff, technical agencies involved in WSS projects still often emphasise technical skills, and pay less attention to management and socio-organisational aspects. The adaptation of **training courses** for the **programme managers** and **engineers** and the introduction of training courses for community workers **provide** good **opportunities to introduce the involvement of women** as one of the factors from which both projects and communities can benefit.

Similarly to the **training of women at village level**, special measures will also be **required to enable women trainers and motivators to participate in training**, and practise in the field. One characteristic of effective training of female trainers is adaptation to their circumstances. Problems of travel, for example, have been overcome by organizing group travel for women in Bangladesh, by using teams of two women and one man in Pakistan, by decentralizing training courses to local levels in Tanzania, and by providing child-care facilities at training centres in Nigeria and Guinea Bissau. In Guinea Bissau, women are also employed as much as possible in their own areas. Failure to do so was the main reason for the turnover of women workers in projects in Nepal, Senegal, and Burkina Faso. Women may also need extra training to gain self-confidence in working with and be accepted by male authorities.

A special problem was the joint training of the male and female promoters. The men were accustomed to taking the leading role and responsibility. In Guinea Bissau it is not common for a women to be in charge, and most village committees directed themselves exclusively to the male promoters, and not to the women in the promotional team. As a result, the male promoters were taking up their tasks more easily and the female promoters made little progress. Once the female promoters, after many discussions, became more secure in taking up their tasks, the male and female promoters became equally effective. (Visscher, Jan Teun and Hofkes, Ebbo (1982). The Buba-Tombali Water Project Guinea Bissau. The Hague, IRC and DGIS.)

b) **Effective training methods**

Programmes to train women as trainers, whether at university or site level **must be well-managed,** if they are to be effective. **The socio-cultural aspects** must be included in **the design of the training programmes,** and **schedules of training** activities-on-site should be **adapted to the women's free time.** Special attention is also needed to bridge the gap that often exists between educated female trainers and the less well-educated trainees.

This means that it is usually a bad idea to bring in outside experts to lecture on specific subjects, such as social analysis or health education. Instead the trainers should have had work experience similar to that of the trainees' future tasks and use task-oriented training methods. In existing programmes, **trainers may have had experience from work within the programme.** In a new programme, the trainers should themselves first acquire experience of the work, or have had very similar experience in other programmes. Trainers may be able to cover all aspects of the training, or may be specialists in one field, for example, social mobilisation or technical aspects, and work in a team. Specialists preferably should come from within the programme, and know as much about the other areas as the trainees will be expected to know. This would then result in a team of trainees with different specialisations. Apprenticeship and practical training will be done in the field, supervised by senior trainers. After two or three years' experience, some trainees will be competent enough to become trainers themselves. Later, with more experience, talented community workers may well become the best trainers, able to take over full responsibility for the training courses.

The greatest **problem** will often be to avoid **instructors who "talk down"** to the trainees. Then the **trainees** in their turn **will "talk down" to the villagers** when they go to work in their project area. This leads to a bossy type of approach which people resent. Even if people build the water supplies or latrines, they are less likely to change their behaviour and increase their self-reliance as a group. The **trainers** should provide the example or **"role model"**, for teaching and learning that the trainees will follow in their dealings with the communities. If they are encouraged to discuss their own ideas and ask 'why' or 'how' until they understand, they will be prepared to encourage villagers to do the same. (White and Gordon (1987) op.cit.,p.77.) (See Additional Reading Part III.)

c) **Expanding the number of trainers**

Training of trainers **aims** to give people with suitable knowledge, skills and attitudes, experience of doing the work of community motivation, education and training. This **will involve practical work,** not a classroom course. In the smaller programmes, project staff gain this experience by first carrying out projects themselves, and then training others for this work (**incremental training**). Programmes aiming for a more rapid expansion can bring together staff with experience in a variety of programmes to form a **team of trainers**, and then organize for them to attend a course on the development and implementation of participatory training programmes.

Another option is to **train key persons at the upper level** of management, and to **enable them to train others** within their own level, as well as key persons at the next **lower level**. This process continues until all levels have received the necessary training. In particular the training of colleagues at the same level promotes a team work approach to the solution of operational problems, and affords opportunities for trainers and trainees to teach each other and learn together. It also provides a large number of trainers in a relatively short time at low cost. (INSTRAW (1986). Training modules "Women, Water Supply and Sanitation.)

Special modules on water, sanitation and health , including technical aspects, can also be introduced into existing training courses for female staff of women programmes and for staff of health and community development services.

This type of integration can lead to more female trainers at relatively low cost and more nearly integrated field programmes. They can also focus more easily on priority areas defined by the communities and women themselves. These often cut across disciplinary boundaries and cover aspects of health, education, nutrition and water supply and income generation at the same time. (INSTRAW (1986). Training modules "Women, Water Supply and Sanitation.)

Examples of training female staff and local women leaders as trainers on water and sanitation technologies come from, among others, Niger, Ivory Cost, Benin, Zaire and Pakistan. In Niger, 22 women's development centres were established in 1975 to serve almost 400 villages. In Benin, the women's centre in Bohicon provides a four-year course for female trainers, including one year of field work.
Training includes water lifting and storage, housing improvements and disease vector control. In Zaire, village women select their own candidates for training. After training in health and simple water technology, trainees are employed by the community development service in their area of origin. (Wijk-Sijbesma, Christine van (1985). op. cit. p. 214.) In Azad Jammu, Pakistan groups of female trainers are trained in construction of household latrines, water filters and rainwater storage tanks, and in turn train selected village women as trainees and motivators. (Clarke, Loma (1983). Training field workers in rural sanitation. Islamabad, UNICEF.)

5.4 Adaptation of institutional training

In the field, much experience and expertise has been built up already with women's involvement in and training for water supply, sanitation and hygiene improvements. However, in most countries, this expertise is not yet fed back into institutional training programmes.

Training curricula at institutes for training engineering, public health and community development staff have **often remained unchanged,** especially at the national level. International training institutes and programmes **pay more attention** to the **integrated approach in water supply and sanitation projects,** but here also, participation of women is not always a structural and systematically covered component of the training courses.

Clearly, **there is a need for better linkage of developments in the field with institutional training programmes** which train future staff and management of water supply, sanitation and environmental health programmes.

Opportunities may for example exist to involve staff from implementation projects as guest trainers in institutional training programmes, and for curriculum developers and trainers to orient themselves regularly on recent field developments, especially in such aspects as community maintenance, management, financing and hygiene improvement, and the way women are involved in these subject areas.

For the institutes' students it is often attractive and motivating to be confronted with issues and case material from projects in their own country or area, and to gain some first hand experience through field visits and practical exercises. This is especially the case when such activities are not isolated and social events, but the whole training is oriented towards future performance in the field.

However, it should be kept in mind that implementation projects have their own objectives to meet and do not have an institutional training task as such, although they will in the longer term benefit themselves from an improved training. The adaptation of institutional training curricula and programmes to women's roles in water supply, sanitation and hygiene, the development of training expertise and the supervision of students in field activities thus rests in the first place with the management and staff of the training institutes. For the implementation of these tasks they can increasingly turn to the growing availability of expertise and case materials in their own country or region, as well as to a growing stock of reference materials and training documents on community involvement and working with women and women's groups.

PART I: Systematic training in ten steps

PART II: WHO "Minimum Evaluation Procedure (MEP) for Water Supply and Sanitation Projects", ETS/83.1, CDD/OPR/83.1, February 1983.

PART III: ILO/UNDP,"Manual for User-Education Community Water Supply", Project INT/81/044,1985.

PART I

SYSTEMATIC TRAINING IN TEN STEPS

1. IDENTIFY THE TRAINING NEEDS AND PRIORITIES

(i) For which occupations will planned training be required -(a) because of current weaknesses? (b) to cater for future developments?

(ii) How many people will need training for these occupations?

(iii) Decide priorities - (a) What are the most critical areas? (b) Where will planned training bring the biggest and/or the quickest return? (c) What resources/constraints will affect these decisions?

2. EXAMINE THE OCCUPATION CHOSEN AS PRIORITY

Is it, in fact, necessary or can the whole system profitably be reorganised to obviate its necessity?

3. ANALYSE THE OCCUPATION. Prepare:

(i) Job description

(ii) Job specification and, if necessary,

(iii) Further analyses of skills, knowledge and, possibly, attitudes, in order to identify areas of difficulty which will thus affect the choice of what must be learned and of appropriate training techniques.

4. SPECIFY, SELECT AND APPRAISE THE PEOPLE TO BE TRAINED

(That is, determine the target population for whom training will be intended)

(i) What aptitudes/personal traits are required (noted on the personnel specification)?

(ii) Will we have to recruit and/or retrain present employees?

(iii) Which of the specified skills, knowledge (and, possibly, attitudes) do the target population already possess? (When compared with the job specification, this will give the "training gap" or training specification.)

5. SET THE TRAINING OBJECTIVES

What must the trainees be able to do, and to what standard, after the training? (This is known as the "criterion behaviour".)

6. DRAW UP A SYLLABUS

The content required to fill the training gap in order to achieve the objectives.

7. PLAN THE TRAINING PROGRAMME

This gives the detailed tactics of training in order to ensure that the objectives will be achieved.

(i) In what sequence will learning take place?

(ii) How will learning be caused?

(iii) By whom will learning be caused?

(iv) Where will learning take place?

(v) How long will be required for learning?

(vi) What resources are required? Do we possess these or can we obtain them? What other constraints are there?

The answers to point (vi) may mean reconsideration of steps 1, 4 and 5 above.

8. IMPLEMENT THE TRAINING PROGRAMME

(that is, cause learning to take place.)

9. CHECK THE TRAINING

(i) Has the training achieved its objectives?

(ii) Were these objectives the right ones?

(iii) Were the results worthwhile? - have they justified the costs?

(iv) In future, could the same results be achieved more economically/effectively by other means?

10. FOLLOW UP THE TRAINING

(i) Ensure that trained personnel put into practice what they have learned.

(ii) If they do not do so, or are not allowed to do so, then identify further needs and return to step 1.

PART II

2.3 HYGIENE EDUCATION

Each country will have to find the right mixture of mass media, folk media, and face-to-face techniques. The relative advantages and disadvantages of each are presented below:

Method	Advantages	Disadvantages
Mass media (example: radio campaign)	Informative. Can be centrally organized and executed.	May not reach linguistic minorities, the poor and those with little liesure. Messages may be misunderstood. One-way communication ineffective for encouraging and reinforcing new hygiene habits. Expensive.
Folk media (example: temple drama)	Entertaining and easily understood. Effective for giving new health insights through analogy and metaphor. Inexpensive.	Requires skillful organization and supervision by people wise in the local culture.
Face-to-face interaction. (example: community health worker treating diarrhoea and teaching prevention)	Two-way communication gives social support to those adopting improved hygiene behaviour. People learn through village activities. Curative and preventive services are linked.	Requires an effective primary health care structure in project villages. Good training and supervision of curative/ preventive workers, and reliable support and supplies back-up are essential. Coordination with project staff is essential.

WHO," Minimum Evaluation Procedure(MEP) for Water Supply and Sanitation Projects", ETS|83.1 CDD|OPR|83.1 , February 1983.

Hygiene education in support of water supply and sanitation projects is best carried out in the local language, by local people who are trusted and who are similar in ethnicity, class and life style to the project beneficiaries. Whenever possible it should be carried out within a system of primary health care services since adult women collect water, store water, handle food, clean latrines, dispose of baby's faeces and so forth, they should be the primary target audience. A separate vertical programme in hygiene education is not recommended. The four indicators of the functioning of the hygiene education component are:

E1: understanding the language of the messages;
E2: understanding the content of the messages;
E3: access to the messages;
E4: face-to-face contact with project staff and other educators.

2.3.1 Indicator E1: understanding the language of the messages

Target - The educational messages must be in a language that the great majority of women in the project area fully understand.

Data required - A representative sample of local women should be surveyed to ascertain the languages in which they are fluent and the languages in which they are literate.

Assessment - If the educational messages are entirely spoken, determine the proportion of women in the project area who are fluent in the language of the messages. If the messages are written, then the proportion who are literate in the language of the messages must be determined. These proportions should be very high. If literacy rates are low among women, only the relatively advantaged minority will be informed, and they probably already have a more hygienic life style.

Possible action - If an inadequate proportion of women are receiving the messages due to language or literacy problems, either the language should be changed, or the mode of delivery, or both.

2.3.2 Indicator E2: understanding the content of the messages

Target - The content of the educational messages should be readily understood by the target audience.

Data required - A representative sample of the target audience should be asked to explain the meaning of some hygiene education messages. Their responses can be scored on a three point scale: good understanding, some understanding, no understanding.

Assessment - If more than, say, 10 percent of interviewees have 'no understanding' of a certain message it indicates a major defect in the message or its mode of delivery. Local meetings or workshops may help to explain the lack of understanding and to elicit ideas on how the educational component may be improved.

Possible action - If the failure is in the message itself, the message should be redesigned. The cultural suitability of a message is very important. Messages should be built upon indigenous concepts of purity, pollution, cleanliness, etc. For example, in Islamic areas Koranic teaching is an effective basis for expanding concepts of personal and environmental cleanliness.

If the failure is in the delivery, consult local people on how to convey messages about cleanliness and redesign the presentations. Consider the use of folk media such as temple drama, traditional story tellers and fiesta clowns. Review recruitment procedures for community education workers to make sure they are not too distant in cultural and social terms from the people they are to educate. Women promotors and educators will probably be most effective in educating and convincing other women to adopt new health promoting habits. This is especially true with sanitation programmes where conversations about excreta may be embarrasing or immoral.

2.3.3 Indicator E3: access to the messages

Target - In most hygiene education programmes mass media will be used to some extent. Mass media include cinema, radio, television, newspapers, posters and pamphlets. There must be a high degree of access of the target audience to the mass media being used.

Data required - Determine the proportion of a representative sample of people in the target groups who have access to the mass media being used. People should be asked to state how many times in the last month they have seen or heard one of the project messages being disseminated in a mass medium, and to recall the content of that message.

Assessment - A judgement must be made on whether enough people are receiving the messages via mass media to justify the costs of the campaign. The proportion of people who at least should have access to the messages will vary with the local situation and depends also on the resources allocated to the mass media campaign. Specific criteria should be developed by the evaluating team.

Possible action - If insufficient people are receiving messages via specific mass medium, this medium should no longer be used and alternative media should be sought.

2.3.4 Indicator E4: face-to-face contact with project staff and other educators

Target - Staff in face-to-face contact with project beneficiaries can reinforce messages from mass media, can explain and amplify them to suit local situations, and can give encouragement to those who are modifying their hygiene habits. The target is to have as much face-to-face contact as possible between beneficiaries and (i) project technicians briefed in hygiene education, (ii) primary health care workers briefed on the projects aims, and (iii) adult literacy teachers, political party officials, school teachers, agricultural extension agents, social welfare workers and others concerned with public health in the project area. All should be briefed on the project and their activities integrated with decade goals through (1) an inter-ministerial national coordinating committee and (2) local area workshops.

Data required - Survey a representative sample to determine the proportion of people in target groups who have conversed with technical staff, primary health care workers, or other workers about environmental health in the past month. To assess both the quality and quantity of interactions, ask people to recall all such meetings in the past month, identify the person met and give the subject of the conversation.

Assessment - Record responses in a table and analyse which kinds of staff are most effective, and what kinds of knowledge and activities are being encouraged.

Possible action - If project technicians are unable to explain the health aims of their activities to beneficiaries a short course or workshop might be organized for them. If primary health care workers are inefficient, their training, supervision and duties might be reviewed. If other categories of health and welfare workers are not involved the national coordinating committee should be informed and workshops initiated in project areas.

NOTES TO THE DISCUSSION LEADER

1. Why Your Work is Important

An improved water system carries with it the promise of improved health. Unfortunately, that promise is not always kept. Plenty of clean water may improve the health of the water users--or it may not. Providing knowledge about HOW to protect and use the water is as important as providing the water itself.

People must understand that improved health requires personal and community sanitation as well as clean and plentiful water.

REMEMBER:

- Community support for the water system is essential to its proper functioning and to the improved health of the people.
- Community education is essential for community support.
- YOU can be an essential part of community education.

You, as a Discussion Leader, have the opportunity to teach community members HOW to use the new water system properly. You may be the key to their good health.

You will share the information in this User-Education Manual with people in the community. You will help them understand facts about the water supply system. You will help give them an understanding of the close relation of water, sanitation and health. Perhaps most important, you will encourage them to use their new knowledge and understanding to form new habits of water use and protection.

2. Who Should Receive the Water/Sanitation/Health Message?

As a Discussion Leader, your goal is to take the water/sanitation/health message to the community. It would be very time consuming to talk individually to each adult in the area, so you will have to organize group meetings. A discussion group should have from 7 to 15 participants.

In order to get the message to more people you may decide to have several groups. Remember, however, that each group must meet 7 different times in order to discuss all the topics in this manual.

Members of the Discussion Groups should be people who are interested in the new water system. Encourage influential community leaders who will spread the message to other people after the group meetings. Try to include the members of the water committee, health workers, teachers and

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ILO|UNDP Project INT|81|044," Manual For User-Education COMMUNITY WATER SUPPLY"

(Draft For Testing Purpose, Geneva, January 1984)

representatives of all organizations. Do not forget to include women. They should be concerned and knowledgeable about water protection and use.

Selection of Discussion Group members will depend on political, cultural and social factors. Ask advice from community leaders before inviting people to join the Discussion Group. Remember that you want to establish a good working relationship with the entire community.

3. When Should the Discussion Group Meet?

The information in this manual is divided into 8 learning/discussion sessions. In most communities you will use only 7 of them (e.g., you will not use Session 7, Springs, if this community has only wells). Decide with the group members if they are willing to meet once a week for 7 weeks or whether they would prefer to meet more often. Evenings will usually be most convenient for farmers and others employed in day-time jobs. One hour per session may be enough for some groups. Others may wish or need to have longer discussions.

If possible, start the discussion sessions as soon as construction (or even planning) of the system begins. At this time, people's interest and enthusiasm will be high.

4. What is in the User-Education Manual?

Each session in the User-Education Manual consists of:

1) a reading section, and
2) a Discussion Opportunity section.

In the first section, the group members learn certain facts about the new water system and its use and protection. In the second section, questions are asked. In this section, the general facts of section 1 are applied to the particular community situation.

In addition to the written material for the group members, there is a Discussion Leader's Guide for each session. In it you will find hints to help you guide each learning/discussion session. The Objectives of each session are listed, special teaching techniques offered, and suggested answers to the discussion questions given.

5. How Should I Use this Manual?

If you are a new discussion leader, you may think of teaching as "telling people things that they should remember". This is called lecturing. IT IS NOT HOW YOU SHOULD USE THIS MANUAL!

When people only HEAR something, they often forget.
When people DO something, they remember.

In this Manual, the DOING is the discussion--the talking about the new information and the deciding how the new information can affect their village. It is very important that you do not just lecture to these adults. You must allow and encourage them to discuss the facts presented in the first section of each learning/discussion session.

REMEMBER:
- Your goal is not just to give new knowledge.
- Your goal is to give new knowledge that will help people change their ATTITUDE toward water/sanitation/health and then change their BEHAVIOR toward water/sanitation/health.

Always read and study the session material and the Discussion Leader's Guide before the group meeting. Be sure that you understand the Session Objectives (they are stated at the beginning of the Discussion Leader's Guide). The Objectives tell you what the group members should be able to do at the end of the session. You will know that the meeting has been successful if they can do what the objectives have stated.

b. Preparation for Each Session

Good teaching requires good preparation. A Discussion Leader should know 1) the learning material (i.e., the facts) in each session, and 2) the social, cultural, religious and political aspects of the community.

To know the learning material (the facts) requires that you carefully study each session. If you want to know more about the subject, discuss it with your supervisor, a medical official or other knowledgeable person.

After reading the session material, decide if the lesson is appropriate for your group members. If everyone in the community already uses pit latrines, for example, you will not need to spend much time with that subject. If, for another example, there is a high rate of Guinea Worm infestation in the community, you should add more information and give more time to that subject.

Preparation before each group meeting is necessary to give you time to prepare or obtain pictures, posters, extra reading materials or guest speakers. For some groups you may not need any of these "extras". For other groups, pictures may be necessary for clear explanations. Plan each session early enough so you have time to get the "extras" that will help you be a good Discussion Leader.

Preparation also demands studying the community. You must be familiar with the place and the people where you are working. You need to know something about the water system--its source, its design, its construction. Even more important is your knowledge of the people of the community--their beliefs, attitudes, local habits, organizations etc. All of these may have some bearing on the subject matter of the session and you must understand them in order to effectively lead the discussion.

7. Teaching Hints (Reading Section and Discussion Opportunity Section)

Section 1, Reading

If the members of your group read well, you may ask them to read the session material before they come to the group meeting. This initial reading will give them an idea of what is to be discussed but it will probably NOT teach them. You must do the teaching.

Begin each session (whether the members can read or not) by going over the material. Talk about the new information; review old information. You may want to read aloud. You may want to translate words. You will probably want to use a chalkboard or flipchart (large sheets of paper to write on that can be displayed where everyone can see) to make simple drawings and write difficult words.

Do not go on to the Discussion Opportunity Section until the group members understand the information in the Reading Section. For some groups and some sessions, the information in the Reading Section will be understood quickly and most of the session will be spent on the Discussion Opportunity. In other groups you may spend the majority of your time teaching the information in the Reading Section.

Section 2, Discussion Opportunity

One important job of a Discussion Leader is to make the group members feel comfortable. They will not speak out in the discussion if they are afraid. They may stop coming to the meetings altogether if you make them feel foolish or childish. You must be friendly and interested in their ideas. You are not a judge. Your job is to present new information and help the group members understand and apply it.

The questions in the Discussion Opportunity are not a test. Often there is no right or wrong answer. The questions provide an opportunity for the group members to think about the relation of water/sanitation/ health in their village. It gives them the chance to voice their opinions.

The discussion is the time for group members to talk. It is NOT the time for you to talk. Your job is to:

a) keep the discussion going by asking open questions;
b) guide the discussion;
c) listen carefully;
d) reinforce important points;
e) summarize occasionally.

a) use open questions

Open questions are questions which ask a person to talk about his thoughts or to give information.

A closed question allows a person to give a very short answer. Look at the following examples.

EXAMPLES: OPEN QUESTIONS

1. Tell me about the connection between water and mosquitos.

2. What do you think could happen if a pit latrine is built too close to our water supply?

EXAMPLES: CLOSED QUESTIONS

1. Can mosquitos be dangerous?

2. Should pit latrines be built close to a water supply?

REMEMBER:
- Closed questions stop discussions.
- Open questions keep discussions going.
- You should phrase questions in such a way that you ask people to give opinions or information.
- Ask open questions!

b) guide the discussion

Sometimes in a discussion, everyone wants to speak at the same time. No one listens to his neighbour. If this happens, you must insist that the group members listen to one another and speak one person at a time. If one person has been speaking for a long time, interrupt and remind him that others also have something to say.

You must also control the discussion to make sure that it stays on the topic. If the speakers begin to talk about other things, you should remind them of the discussion question and bring the conversation back to the original topic.

c) listen carefully

Give all your attention to each speaker. Listen carefully. Let him know that his ideas and opinions are important.

It is sometimes a good idea to briefly write down people's suggestions or opinions while they are talking. Write them on the chalkboard or flip chart. Later those ideas can be used as an outline to summarize the discussion.

d) reinforce important points

When speakers give ideas or information that is important, you should acknowledge it. You can repeat the comments or use your own words to re-state the same idea. You can write the ideas on the chalkboard. You can also show that a speaker's comments are important by your facial expression. An encouraging nod and smile of approval lets people know that you agree with their ideas.

e) summarize occasionally

A discussion is not just a conversation. A discussion has a topic and a goal. To help remind the group members of the topic and

the end, you should occasionally give a brief summary of the discussion. If the discussion is long, do not wait until the end of it to summarize. Stop several times in the middle of the discussion to review the important points that have been made and to summarize the progress of the discussion.

8. Teaching Hints (Role-playing and Follow-up)

In Sessions 3 and 5 role-playing is suggested in the Discussion Opportunity.

Role-playing is a teaching technique in which people act as if they were someone else. They do not have a written script. They use their own words and act out a very short play. The Discussion Leader first explains the characters and the situation. He might say, for example,:

"Joe, pretend you are the worried father of a sick baby who has diarrhoea. You are talking to your neighbour who explains that unclean water is probably the cause of the illness. You do not believe this.

" John, you act as the neighbour. Try to teach Joe about the transmission of disease."

Role-playing is a useful teaching technique because it allows people to "try-on" new opinions and knowledge while pretending to be someone else. It is a fact that after people have publicly stated an opinion, they are more firmly committed to it. Therefore, if you can create situations in which the group members can practice using their new knowledge, and practice stating new opinions, you will be helping them to accept the new ideas.

Some people may not be comfortable doing role-plays. Do not force group members to act if they don't want to. Those who do not want to act should watch and discuss the action of the characters after the role-play. The entire group can discuss and learn from the actions of only 2-3 in the role-play.

Two more things to remember about role-plays are:

1. Demonstrate a role-play before asking participants to do one of their own.

2. Most role plays should last less then 5 minutes.

Follow-up

Your teaching job does not end when each learning/discussion session is ended. If you want the group participants to learn new knowledge and change their attitudes and behavior, you must follow-up the sessions.

Follow-up means that you keep teaching and keep talking and keep helping people change their behavior as often as you can. When, for example, the group is meeting for Session 4, remind them of their ideas

about Sessions 1, 2 and 3. When you see group members outside of the meeting time, ask them if they are practicing newly learned rules of hygiene. Observe people's habits. Be a good example yourself and remind others of good rules of hygiene if you see them breaking the rules.

Encourage group members to tell their friends and neighbors about their new knowledge. Help them spread the water/sanitation/health message. Share pictures, posters, books. Share your time so that the message is not only spread--but also, remembered.

Follow-up to make sure that the time you have spend in preparing for and leading the discussions will not be wasted time.

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43. UNICEF: **A manual Report 1988: Water and Sanitation.** UNICEF, New York, WET Section.

44. WHO (1983): **Maximizing Benefits to Health , Geneva.**

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47. Visscher, Jan Teum and Hofkes, Ebbo (1982): **The Buba-Tombali Water Project Guinea Bissau.** The Hague, IRC and DGIS.

48. Wijk-Sijbesma, Christine van (1985): **Participation of Women in Water Supply and Sanitation: Roles and Realities.** The Hague, IRC and PROWWESS/UNDP.

49. White, A.T. et al (1985): **Research Needs in Community Participation and Health Problems.** Paper presented at a regional consultation on research needs in community education and participation in drinking water supply and sanitation, WHO Regional Office for the Eastern Mediterranean, Amman, Jordan.

50. White, Alastair and Gordon, Gill (1987): **Training Community Motivators in Water Supply and Sanitation.** WHO and IRC.

51. Wolde, Emanuel, Y. (1984): **The Drinking Water Supply Sanitation in Africa and the Role of Women.** Cairo, Egypt.

1. Why is it important to include health/hygiene education in WSS projects?

2. What are the roles of women in health/hygiene education?

3. What are the main steps in the management of training activities of a WSS project? Indicate women's role in each step.

4. Which constraints prevent participation of women in training programmes for WSS projects?

NAME OF PARTICIPANT

.....

INSTITUTION

.....

OCCUPATION

.....

COUNTRY

.....

DATE

.....

Mark the box which corresponds best to your opinion on each question.

1. Your professional interest in the particular topic included in this modular unit was:

   high ☐ ☐ ☐ ☐ low

2. The objectives of this module were:

   clear ☐ ☐ ☐ ☐ not clear

3. Would you say that the objectives of this module met all, some or none of your expectations?

   3.a) Which objectives were not met?

3.b) Explain briefly why the objectives were not met.

4. The contents of this module were:

well structured ☐ ☐ ☐ ☐ badly structured

4.a) If they were badly structured, explain why.

5. The terminology in this module was:

easy to understand ☐ ☐ ☐ ☐ hard to understand

6. The visual material (slides, drawings, diagrams...) used in this module was:

clear ☐ ☐ ☐ ☐ confused

useful ☐ ☐ ☐ ☐ useless

7. The checklists have covered the subject studied:

completely ☐ ☐ ☐ ☐ not at all

8. The checklists were:

useful	☐	☐	☐	☐	useless
too simple	☐	☐	☐	☐	too complicated
sufficient	☐	☐	☐	☐	insufficient

9. Studying this module enabled you to learn:

many new things	☐	☐	☐	☐	nothing new

10. The knowledge acquired through this module will, in your present profession be:

useful	☐	☐	☐	☐	useless

11. The knowledge acquired through this module will, in the near future be:
(Reply to this question only if the answer to question no. 10 is negative)

useful	☐	☐	☐	☐	useless

12. List the topics you would like to have treated more extensively:

1) .....

2) .....

3) .....

13. List the topics you would like to have treated to a lesser extent:

1) .....

2) .....

3) .....

14. List the topics not included in this module which you think are of particular interest to your profession:

    1) .....

    2) .....

    3) .....

15. List any suggestions for improvement of this training module:

    .....

    .....

    .....

    .....

    .....

    .....

This evaluation questionnaire should be sent to:

UN/INSTRAW,
P.O. BOX 21747
SANTO DOMINGO
The Dominican Republic

TRAINER'S GUIDE

HARDWARE

1. Overhead projector
2. Screen
3. Slide projector, 24 mm with synchroniser
4. Blackboard
5. Flipcharts (optional)
6. Tape recorder

DOCUMENTS TO BE USED BY THE TRAINER

See "Module Structure", page 3

DOCUMENTS TO BE DISTRIBUTED TO TRAINEES

WIII-1.1: Target groups

WIII-1.2: Objectives

WIII-2.1: Table of contents

WIII-2.2: Text

WIII-2.3: Additional reading

WIII-2.4: Bibliography

WIII-3.1: Checklists on key issues for group work

WIII-3.2: Evaluation questionnaire

KEY POINTS	TRAINING METHOD AND ACTIVITIES	DOCUMENTS TO BE DISTRIBUTED	AUDIOVISUAL SUPPORT MATERIAL
INTRODUCTION			
1. Objectives	Presentation		
2. Linking hygiene to WSS projects	Presentation		WIII-1 WIII-2
PRESENTATION			
3. Women and water-related diseases	Presentation		WIII-3
4. Roles of women in hygiene education activities	Presentation/discussion		WIII-4
5. Training activities in WSS projects and programmes	Presentation		WII-3
6. Prototype guidelines for training programme	Presentation/discussion		WIII-5 WIII-6 WIII-7 WIII-8
7. General guidelines for training women in WSS projects	Presentation/discussion		WIII-9
8. Training women for local maintenance and management	Presentation		
9. Women's involvement in training programmes	Presentation/discussion		WIII-10 WIII-11
10. Training project staff on women's involvement in WSS projects	Presentation		WIII-12
11. Orientation of policy-makers, field staff, trainers	Presentation/discussion		WIII-12
12. Adaptation of institutional training	Presentation		WIII-13
SUMMARY			
13. Key issues checklists	Group discussion	Checklists WIII-3.1	
14. Presentation on checklists	Plenary discussion		
MONITORING AND CONTROL			
15. Module evaluation questionnaire	Individual activity	Questionnaire WIII-3.2	

NAME OF TRAINER .....

COUNTRY ..... **DATE** .....

AVERAGE EDUCATIONAL QUALIFICATIONS OF PARTICIPANTS .....

.....

.....

.....NUMBER OF PARTICIPANTS .....

Mark the box which corresponds best to your opinion on each question.

1. To what extent has the module achieved the objectives stated?

☐ over 80%

☐ 70 – 80%

☐ 60 – 70%

☐ 50 – 60%

☐ less than 50%

2. Did the objectives meet the needs of the group?

totally ☐ ☐ ☐ ☐ not at all

3. On the basis of the objectives stated, the subject matter is:

relevant ☐ ☐ ☐ ☐ irrelevant

4. The progression of the subject matter is:
(Give reasons for your answers)

too fast ☐ ☐ ☐ ☐ too slow

5. List the topics you would like to have treated in the package more extensively:

   a) .....

   b) .....

   c) .....

6. List the topics would like to have treated to a lesser extent:

   a) .....

   b) .....

   c) .....

7. List the topics not included in this module that you think should be included:

   a) .....

   b) .....

   c) .....

8. The technical quality of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

9. The relevance of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

10. The quantity of the audiovisual material was:

    high ☐ ☐ ☐ ☐ low

11. The sound/slide package (where applicable) was:

    too long ☐ ☐ ☐ ☐ too short

12. Your global evaluation, bearing the objectives and teaching resources of the module you have tested in mind is:
(Give reasons for your answer)

excellent ☐ ☐ ☐ ☐ mediocre

After completion, please forward this document to:

UN/INSTRAW,
P.O. BOX 21747
SANTO DOMINGO
The Dominican Republic

WIII-1: Complementarity of water supply, sanitation and hygiene education

WIII-2: Goal of hygiene education activities

WIII-3: Effective forms of hygiene education

WIII-4: Roles of women in hygiene education activities

WIII-5: Prototype guidelines for the preparation, implementation and evaluation of training components

WIII-6: Systems approach to a training process

WIII-7: Systematic training in ten steps

WIII-8: Programme training

WIII-9: Training of women for culturally appropriate tasks

WIII-10: Facilitation of women's involvement in training

WIII-11: Updating of training methods

WIII-12: Training activities at various levels

WIII-13: Adaptation of institutional training

TRANSPARENCIES

COMPLEMENTARITY OF WATER SUPPLY, SANITATION AND HYGIENE EDUCATION

HEALTH BENEFITS FROM ENGINEERING PROJECTS REQUIRE A COMPLEMENTARITY OF WATER SUPPLY, SANITATION AND HYGIENE EDUCATION FOR:

- CONSISTENT USE OF MORE WATER
- CONSISTENT AND HYGIENIC USE OF SAFE WATER
- CONSISTENT AND HYGIENIC USE OF SAFE EXCRETA DISPOSAL
- DRAINAGE OR REUSE OF WASTE WATER
- SAFE SOLID WASTE DISPOSAL

GOAL OF HYGIENE EDUCATION ACTIVITIES

HYGIENE EDUCATION AIMS NOT ONLY AT EDUCATING PEOPLE

BUT ALSO

HELPING THEM TO IMPROVE LOCAL HYGIENE CONDITIONS AND PRACTICES

EFFECTIVE FORMS OF HYGIENE EDUCATION

LEAST EFFECTIVE:

DIDACTIC APPROACH

- INFORMATION
- INSTRUCTION

MORE EFFECTIVE:

PROMOTION APPROACH

- INVESTIGATION OF PEOPLE'S NEEDS
- PROMOTION IMPROVEMENTS TO MEET NEEDS

PARTICIPATION APPROACH

- JOINT SITUATION ANALYSIS
- JOINT PROBLEM SOLVING

ROLES OF WOMEN IN HYGIENE EDUCATION ACTIVITIES

AS USERS:
MAJOR TARGET GROUP

AS DOMESTIC MANAGERS:
KNOWLEDGEABLE PLANNERS

AS HEALTH COMMUNICATORS:
TRAINERS OF OTHER WOMEN

BUT:

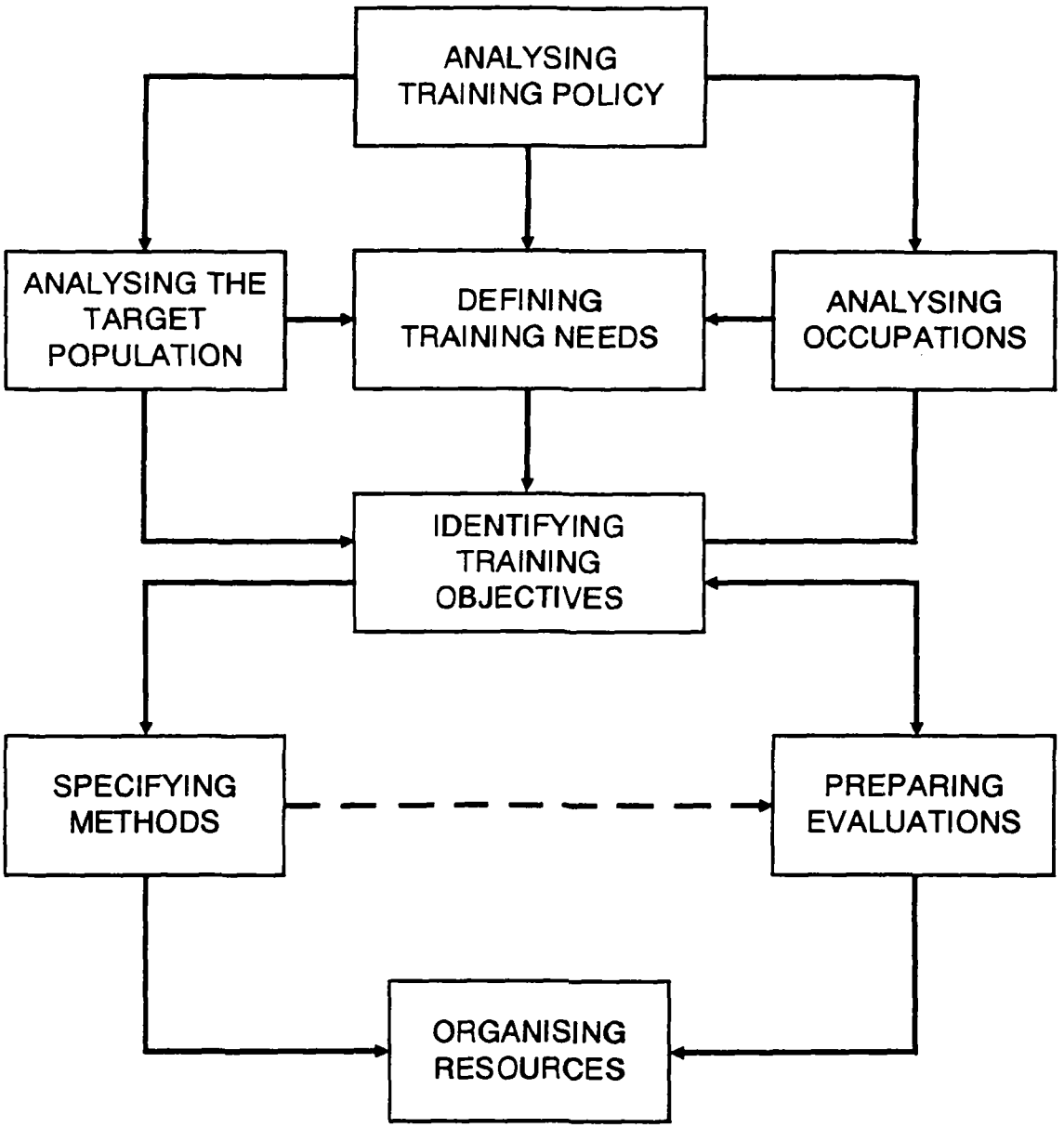
ADAPT TO DIFFERENT POSITION, TASKS, INCOME LEVELS OF WOMEN

DO NOT EXCLUDE MEN

PROTOTYPE GUIDELINES FOR THE PREPARATION, IMPLEMENTATION AND EVALUATION OF TRAINING COMPONENTS

1. IDENTIFICATION OF HUMAN RESOURCE AND TRAINING NEEDS
2. IDENTIFICATION OF EXISTING TRAINING CAPACITY
3. PREPARATION OF THE TRAINING PROGRAMME
4. EVALUATION OF TRAINING

SYSTEMS APPROACH TO A TRAINING PROCESS



SYSTEMATIC TRAINING IN TEN STEPS

1. IDENTIFY THE TRAINING NEEDS AND PRIORITIES
2. EXAMINE THE OCCUPATION CHOSEN AS PRIORITY
3. ANALYSE THE OCCUPATION
4. SPECIFY, SELECT AND APPRAISE THE PEOPLE TO BE TRAINED
5. SET THE TRAINING OBJECTIVES
6. DRAW UP A SYLLABUS
7. PLAN THE TRAINING PROGRAMME
8. IMPLEMENT THE TRAINING PROGRAMME
9. CHECK THE TRAINING
10. FOLLOW UP THE TRAINING

PROGRAMME TRAINING

ARE WOMEN'S TRAINING NEEDS IDENTIFIED?

DO THEY GIVE EQUAL OPPORTUNITY TO WOMEN?

WHAT IS THE PROPORTION OF WOMEN IN TRAINING COURSES AND PROGRAMMES?

WHAT SPECIAL EFFORTS ARE BEING MADE TO INVOLVE MORE WOMEN?

WHAT PROPORTION OF FELLOWSHIPS GO TO WOMEN?

HAVE THEY ENCOURAGED WOMEN'S PARTICIPATION?

TRAINING OF WOMEN FOR CULTURALLY APPROPRIATE TASKS

- SYSTEM CARETAKERS
- REGULAR MAINTENANCE AND WATERPOINT REPAIR
- PROMOTION AND CONSTRUCTION OF LATRINES
- MAINTENANCE OF LATRINES
- IMPROVEMENT OF HYGIENE
  - DOMESTIC
  - COMMUNITY
- MANAGEMENT OF LOCAL WATER SYSTEM
  - HEALTH ASPECTS
  - FINANCIAL ASPECTS
  - COMMUNICATION WITH WOMEN
- TRAINING OF TRAINERS

FACILITATION OF WOMEN'S INVOLVEMENT IN TRAINING

PROPORTIONAL RECRUITMENT OF WOMEN FOR TRAINING

INVOLVEMENT OF WOMEN IN SELECTION OF SUITABLE CANDIDATES

ADAPTATION OF TRAINING DURATION, VENUE AND FACILITIES TO WOMEN'S CONDITIONS

ADAPTATION OF TRAINING MATERIALS TO LIFESTYLE AND CAPACITIES OF WOMEN

COORDINATION OF TRAINING WITH OTHER AGENCIES FOR GREATER EFFICIENCY AND AVOIDANCE OF OVERLOAD

PROVISION OF SUPPORT AFTER TRAINING

UPDATING OF TRAINING METHODS

TRAINING ACTIVITIES FOR COMMUNITY WOMEN AND PROJECT FIELD STAFF SHOULD GO BEYOND THEORETICAL KNOWLEDGE TRANSFER AND DIDACTIC TEACHING TO DEVELOPMENT OF:

- POSITIVE ATTITUDES ON PEOPLE'S CAPACITIES
- PRACTICAL SKILLS
- CREATIVE LEARNING METHODS
- PROBLEM-SOLVING CAPACITIES ("LEARNING TO COPE")

TRAINING ACTIVITIES AT VARIOUS LEVELS

A. AT MANAGERIAL LEVEL:

- ORIENTATION OF POLICY-MAKERS ON WOMEN'S INVOLVEMENT

B. AT PROJECT LEVEL:

- TRAINING MALE AND FEMALE STAFF IN:
  - PARTICIPATORY TECHNIQUES
  - CONTENTS SKILLS
    - . PARTICIPATORY HYGIENE EDUCATION
    - . BASIC WATER AND SANITATION TECHNOLOGIES
    - . WATER CYCLE AND WATER RESOURCE MANAGEMENT
    - . INVOLVEMENT OF WOMEN IN ALL PROJECT PHASES
    - . LOCAL MAINTENANCE SYSTEM
    - . OPTIONS FOR LOCAL MANAGEMENT AND FINANCING
    - . SIMPLE BOOKKEEPING, ACCOUNTABILITY AND CONTROL

TRAINING ACTIVITIES AT VARIOUS LEVELS (CONT.D)

C. AT PROGRAMME LEVEL (TRAINING OF TRAINERS)

- ESTIMATE NEEDED NUMBER OF FEMALE TRAINERS
- ADAPT COURSES AND EMPLOYMENT TO WOMEN'S CONDITIONS
- USE PARTICIPATORY AND CREATIVE METHODS (NOT JUST LECTURES)
- AIM AT RAPID, LOW-COST EXPANSION OF TRAINED TRAINERS, BY:
  - USING TRAINED PROJECT STAFF TO TRAIN STAFF IN OTHER PROJECTS
  - TRAINING KEY PERSONS TO TRAIN COLLEAGUES
  - TRAINING WOMEN AT HIGHER LEVELS TO TRAIN LOWER LEVELS

ADAPTATION OF INSTITUTIONAL TRAINING

FEEDBACK OF FIELD DEVELOPMENTS

ADAPTATION OF TRAINING CURRICULA

SYSTEMATIC INTEGRATION OF WOMEN'S ROLES THROUGHOUT COURSE AND MATERIALS

LINKAGE OF INSTITUTIONAL TRAINING WITH FIELD PROJECTS

- FIELD STAFF AS GUEST LECTURERS
- USE OF FIELD CASES
- FIELD WORK
- FAMILIARISATION OF TRAINERS/SUPERVISORS WITH FIELD ISSUES

MODULE IV

PARTICIPATION OF WOMEN IN MANAGEMENT OF WATER RESOURCES, WATER SUPPLY AND WASTE DISPOSAL

The present training modules on **"Women, Water Supply and Sanitation"** comprise an up-dated revision of the modules originally prepared in 1986 by the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) and the ILO Training Centre, in Turin, Italy.

This version, has been undertaken as a collaborative effort by INSTRAW, the ILO Training Centre in Turin, Italy, and the United Nations Department of Technical Co-operation for Development (UN/DTCD), through its Task Force on Women's Development. The production of the training packages was funded by UN/DTCD.

The DTCD Task Force, established in 1982, is the oldest such entity in the United Nations system, and comprises collective expertise and experience in all substantive sectors within the Department's mandate: natural resources and energy; development planning; statistics; public administration; population; and social development. The prime objective of the Task Force is to promote the integration of women in all aspects of development. The issuance of the up-dated modules is an initiative towards that end.

The training package was **up-dated** by **IRC**-International Water and Sanitation Centre, The Hague, The Netherlands. It was **reviewed** by **Ms Dunja PASTIZZI-FERENCIC**, Director, Natural Resources and Energy Division (UN/DTCD), **Mr. Kenneth EDWARDS**, Chief Water Resources Branch (UN/DTCD), **Ms Margaret HOWARD**, Programme Officer and **Ms Marcia BREWSTER**, Programme Officer, Water Resources Branch (UN/DTCD). The training package was **completed** and **finalized** by **Ms Borjana BULAJICH**, Social Affairs Officer, UN/INSTRAW.

The audiovisual support material was prepared by **Ms Adelina GUASTAVI**, Programme Manager, **ILO Training Centre**, with the support of the Media Production of the ILO Training Centre in Turin, Italy. The training package was completed under the guidance of **Mr. Giulio PIVA**, Chief Training Operations, **ILO TRAINING CENTRE**.

The team would particularly like to express their appreciation to **Ms Lilian Moro** for her patience in the word-processing of this training material, and to **Ms Denise Zoccola** for the final desktop publishing layout.

The modules are conceived as a package containing all the information, examples, exercises, audiovisual and control aids necessary for:

- the **trainer** to deliver a lesson or conduct training activities;

and/or

- the **trainee** to analyse, reinforce and apply the theoretical concepts learned during training sessions;

and/or

- the **professional** as self-learning reference material to upgrade knowledge and skills related to effective integration of women in WSS sustainable projects and programmes.

In order to reduce the learning time and improve the learning efficiency, keeping high the motivation of the user, the text of the module contains only that information and activities considered essential for the achievement of the training objectives as specified in the following pages. Additional reading material is included for those users who wish to study in greater depth specific subjects related to the subject considered in this module.

From a pedagogical point of view, the structure of the modular package consists of five components – as specified on the following page – which are easily adaptable to the needs of both the trainer and the trainee.

1. *INPUT DOCUMENT*

1.1 Target groups

1.2 Objectives

2. *BODY OF THE MODULE*

2.1 Table of contents

2.2 Text

2.3 Additional reading

2.4 Bibliography

3. *OUTPUT DOCUMENTS*

3.1 Checklists on key issues for group work

3.2 Evaluation questionnaire

4. *TRAINER'S GUIDE*

4.1 List of training material

4.2 Lesson plan

4.3 Trainer's guide evaluation form

5. *VISUAL SUPPORT MATERIAL*

5.1 List of audiovisual support material

5.2 Transparencies

The trainer will make use of the five components indicated above, while the trainee will only be provided with the material related to components 1, 2 and 3.1.

- Senior officials of Ministries of Education, Health, Planning, Public Affairs, Social Welfare, etc.
- Development planners and provincial or local authorities in charge of water supply and sanitation projects and programmes.
- Engineers in charge of designing and implementing water supply and sanitation projects..
- Representatives of non-governmental organizations, including women's organizations, which are active in water supply and sanitation projects and programmes.
- Trainers and managers of national training institutes training staff on drinking water and sanitation technologies, health education, community development and women's programmes.

GENERAL OBJECTIVE

To enable the users to apply the integrated water resource development planning, taking into account water demand management, waste disposal, environmental protection, the roles of women and the economic tools.

SPECIFIC OBJECTIVES

Upon completion of this unit, the users will be able to:

1. identify new issues and trends in water resource development planning , demand management and environmental protection;

2. recognize the implications these developments have for the national economies and the crucial role of women in rural, peri-urban and urban areas;

3. identify areas and issues for projects on women's involvement in the management of water resource development as well as financial management and control.

Page

1. *SUSTAINABILITY OF WATER AND SANITATION DEVELOPMENT**

Looking at world development, there is in all countries a growing concern that while much of the population still struggles to meet basic needs, the current way of life is no longer sustainable. In both industrialized and developing countries, water and land resources are being degraded. Surface and ground water become polluted, and land productivity is reduced by widespread salinization, waterlogging, soil erosion and desertification. (Table 1.)

- If the present rate of land degradation continues, almost **one-fifth of the world's** arable land will have **disappeared by the year 2000.** (International Union for Conservation of Nature and National Resources (1980). World Conservation Strategy.);
- **Each year six million hectares are degraded** to desert-like conditions. Over three decades, this would amount to an area as large as Saudi Arabia (World Commission on Environment and Development (1987). Our Common Future. London, Oxford University Press.);
- Throughout the developing world, **water polluted by sewage or industrial wastes has serious consequences for human health**; in India 70 percent of all surface water is polluted (World Resources Institute and International Institute for Environment and Development (1986). World Resources (1986). New York, Basic Books.);
- More than **11 million hectares of tropical forests are destroyed every year.** Over 30 years, this would amount to an area about the size of India; (World Commission on Environment and Development (1987). Our Common Future. London, Oxford University Press);
- **Each day an average of one animal or plant species becomes extinct**; most of these will disappear without ever having been discovered.

These adverse trends have led the World Commission on Environment and Development, under the leadership of the Norwegian Prime Minister Ms. Brundtland, to issue a strong call for sustainable development. In its widest sense, **sustainable development** refers to "**the ability to meet the needs of the present generation without jeopardizing the ability of future generations to meet their own needs**".The availability and the reliable supply of good quality water are among the most basic needs of these generations.

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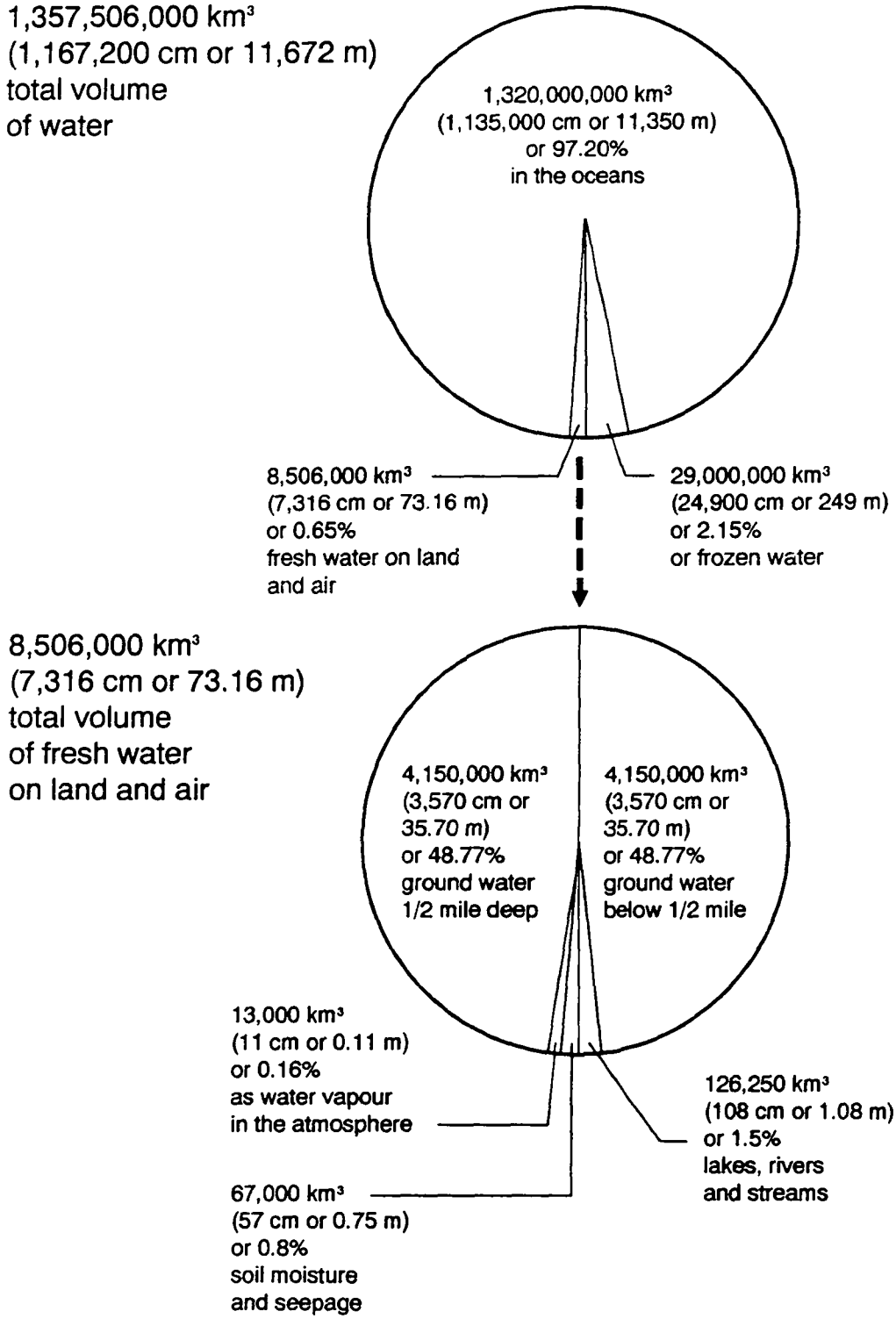
* This section 1.1 to 1.5 is based on: UN/DTCD **"Integrated Water Resources Planning"**. A strategy for the Implementation of the Mar del Plata Action Plan for the 1990s, UN, New York, 1991, a report prepared by Prof. Alvin Goodman of the Polytechnical University in New York.

Table 1
Water Availability on Earth
(Source: Doxiadis, 1967, in Water Encyclopedia, 1990)



1.1 Purposes and objectives of water resources development

A **water resources plan** is initiated in order to **meet a demand** for water (municipal and industrial water supply, irrigation and water supply), **solve a problem** caused by water (flood control, water quality improvement) **or take an advantage of an opportunity** (dam site for hydroelectric power development). The following is a list of the principal **purposes and functions** of water resources projects:

- water supply for municipal and industrial uses
- water supply for rural uses
- water supply for thermal-electric power plant cooling
- irrigation, including water supply
- flood control and damage prevention
- hydroelectric power
- navigation
- water quality management, including waste water treatment and disposal and flow augmentation
- recreation
- commercial fishing and trapping
- drainage, sedimentation control, land stabilization, erosion control, and other measures for management of urban and rural lands and water sheds.

Plans may be **single-purpose** or **multi-purpose.** They may also be **single-unit or multi-unit.** When a number of projects are staged over a **planning horizon,** this constitutes a **programme** of development. Projects and programmes may refer to a single **economic sector** such as electric power or may be multisectoral. Virtually all water resources projects and programmes involve not only their basic purposes and functions but also roads, marketing services, housing and community services, and other components of the physical, economic, and social **infrastructure.**

Planning, development, and management of water resources may also be used to further the general well-being, including:

- regional economic development
- income distribution, particularly for women
- health and safety
- educational and cultural opportunities
- emergency
- other measures to improve the "quality of life".

The growing environmental movement has also encouraged policies to plan and manage water resources for the preservation and enhancement of:

- natural water and related land areas, including aesthetical values
- archeological, historical, biological and geological resources
- ecological systems
- water, land and air quality.

From the standpoint of economic impacts, water resources projects, since they satisfy demands, solve problems, and strengthen the infrastructure, are needed as underpinnings of economic growth. If not undertaken, the economic growth of an area is slowed or set back. The direct and indirect economic benefits resulting from such investments increase national and regional income accounts, particularly in developing countries.

1.2 Interdisciplinary nature of water resources planning

Water resources planning involves a **variety of professional disciplines.**, for example, the preparation of a complex flood control plan may require the following:

- engineers - civil, structural, hydraulic, hydrological, geotechnical, construction, cost estimating, mechanical, electrical, surveying and mapping, drafting
- urban and regional land planning specialists
- architects
- economic and financial specialists
- environmental specialists - biological sciences of various types, forestry, archeological, historical, geological, water and air quality, soils
- sociologists and WID experts
- real estate and relocation specialists

If the project has multipurpose development opportunities, additional specialists may be needed to study them. In a **developing country**, virtually all water **resources planning** is carried out by or under the **auspices of public authorities**. Such planning may be at the national, sectorial, or project levels and may involve national, regional or local agencies and the general public.

The term **integrated water resources plan** may refer to a **national, sectorial, or project plan** serving one or more purposes and functions, to be implemented in one or a group of stages. The word **integrated** implies that the **planning** work incorporates contributions of **multi-disciplines and multi-sectors** and considers a wide range of societal interests.

1.3 Issues specific to water resources planning

There are a number of **issues** that are **specific to water resources planning,** which apply to all areas of public interest in infrastructure. **These include:**

- the water resources as a system
- social and environmental impacts
- institutional and legal aspects
- physical threats to water resources systems
- sustainability of water resources development

Many studies of the **United Nations** have in the past two decades, considered the **failures or inadequate achievement** of goals of water development projects.Comments in recent years have focussed on shortcoming such as: (1) **projects** that are too ambitious considering the **limited financial and other resources of developing countries;** (2) **inadequate attention for environmental, socio-cultural, economic, land-users, institutional and legal aspects** of project planning, implementation and operation; (3) **failure of comprehensive plans to guide development properly and/or failure of project to correspond** to these plans; (4) **failure of comprehensive plans to guide development** properly and/or **failure to create an organization with adequate staffing** and responsibilities to ensure that projects are sustained beyond the construction and early operation stages.

A single framework for effective integrated water resource planning is not possible for all countries and regions, considering that they are different in their natural resources; population distribution and styles of living; economies; social, cultural, political, institutional and legal structures, and other characteristics. However, some overall principles of planning may apply based upon experiences with planning in many developing countries and the tools that are available for assessment and analysis.

It must be recognized that **integrated water resources planning** should have **two** principal **goals:** (1) to plan programmes and **projects** that are **economically and socially acceptable,** and (2) to **execute projects** that will be beyond the exodes of foreign financing and technical assistance ahd the repayment of loans. These principal goals should be kept in the forefront during all stages of planning, implementation, and maintenance and operation. It implies that water resources development and management will contribute as much as possible to the amelioration of basic problems of the human condition in developing countries, while avoiding serious damages to ecological populations and environmental quality. In addition, full benefits of water resources development cannot be achieved unless national, regional, local and individual costs and benefits are all recognized in formulating and analyzing projects and selecting priorities.

1.4 Current threats to the system related to water resources development

The **Mar del Plata conference** on water development and management in 1977 pointed out that: ".....globally there may be potentially enough water to meet forthcoming needs. But, frustratingly, it tends to be available in the wrong place, at the wrong time, or with the wrong quality. And in one way or the other, all societies are affected, however rich, however poor...." These problems affect different societies in different ways. The immediate concern may be unpotable water and human waste in the shanty town of a tropical city, multiplying wastes in an industrialized high-income country, shortage of water impeding agricultural development in an arid land, watershed destruction and ground-water depletion in an entire nation.

Acid rain is already an important problem. The effects of acid rain are not yet fully understood, but damage has already been observed not only in lakes and streams but on forests, soils, crops and nitrogen-fixing plants.

Destruction of forests, along with the burning of fossil fuels, are major contributors to the long-range concern with climatic change. World Bank and United Nations studies (Repetto, 1985) have found that every year more than 11 million hectares of forests are cleared for other uses, and in most developing countries deforestation is accelerating. In this century, the forested area in developing countries has fallen by half, with severe environmental consequences. An estimate prepared for the Global 2000 Report suggested that between 1980 and 2000 between half a million and 2 million species could be extinguished by 2000 mainly because of loss of wild habitat, but also in part because of pollution.

Urbanization is increasing at a rapid rate in many parts of the world, placing enormous stress on water and other natural resources, not only in terms of exploitation for water supplies and water waste disposal, but also from the standpoints of environmental and ecological modifications.

Destruction or pollution of coastal ecosystems is an increasingly important problem. The rapidly expanding cities and industries are likely to claim coastal wetland areas for development; and this effect must be considered along with coastal pollution problems due to agriculture, industry, logging, water resources development, energy systems, and coastal community development.

1.5 Future threats to the system

Climatic changes are probably the most worrysome threat for the long-term future of the world's water systems and the effect of such change on climate and hydrological systems. The U.S. Global Ghange Research Programme prepared a report (Committee on Earth and Environmental Sciences, 1990) and the following is quoted from it:

- **Greenhouse warming.** A key issue is how the physical climate system changes naturally and will respond to changes in radiative forcing cause by increasing atmospheric

concentrations of greenhouse gases. Of particular concern are changes in temperature, precipitation, soil moisture, and severe weather. Clouds strongly influence the magnitude of climate change, while the oceans influence the timing and patterns of climate change.

- **Sea level rise.** Of major concern to coastal communities are the problems of coastal erosion, loss of wetland and inland penetration or instrusion of saltwater due to changing sea level, a problem linked to climate and tectonic change.
- **Water supplies.** The future availability of adequate water supplies is one of the most significant natural resource questions in many regions. Information on the rate and magnitude of climate change relative to the future availability of water is vital for water resource planners.
- **Agricultural policy.** Crop yields are strongly tied to rainfall and retention of soil moisture. For example, the 1988 drought in the U.S. had a significant impact on the national economy, and prolonged droughts in other parts of the world, e.g., the Sahel, have had severe consequences for human life. The ability to anticipate such events would have strong implications for farm assistance programmes, agricultural trade, and relief programmes.
- **Stratospheric ozone depletion.** In addition to changing surface ultraviolet radiation, changes in stratospheric ozone will also influence the Earth's climate to an undetermined degree. Regulation of chlorofluorocarbons (CFGs) based on ozone depletion concerns would also influence the global radiative balance, since CFGs are also greenhouse gases.
- **Environmental quality.** Climate change, whether natural or human influenced, can have a profound impact on environmental quality. Changes in temperature, precipitation, atmospheric stability, and/or wind velocity can all influence attainment of air quality standards, while changes in hydrology and stream flow could impact water quality of both fresh water and estuarine systems and could also affect the disposal of waste products by allowing water intrusion into previously dry land fills.

1.6 Preservation of water resources

Ensuring the availability of water is the responsibility of the water resources sector. For this sector, sustainability means the ability to meet present and future water needs, without depleting available resources and without contaminating either the water sources themselves or the surrounding lands on whose drainage, filtering and strategic storage capacities the sources rely.

In the first module it was already seen how depletion of water sources and degradation of water quality are on the increase. Of **water scarcity**, two types, **aridity and natural droughts**, are related to natural causes. But the other two are man-induced: **landscape desiccation**, from deforestation and over-exploitation of ground water, and **water stress**, or competition for limited amounts of water for different purposes. (Falkenmark, Malin

(1989). Water Scarcity, Much More than Droughts. Stockholm group for studies on natural resources management.)

Landscape desiccation

Increasing economic pressure has in some parts **led to reckless deforestation** of upland watersheds. Cutting down trees has worsened soil erosion and acerbated droughts and floods. **Droughts increase** because **less rainwater** returns to the atmosphere from wet foliage and transpiration. **Floods increase** because there is **less vegetation** and soil to absorb and retain the down flow of rainwater. **Floods cause a further deterioration** in conditions by taking down more vegetation and topsoil, leading to a vicious and down-ward spiral of alternatively too much and too little water.

> *It is estimated that these and other desiccation processes turn 6 million hectares of land into desert each year. In India, Uttar Pradesh had 17,000 villages with water scarcity in the 1960s. In 1972 the number had doubled, and by 1985, shortage had spread to 70,000 villages. Similar developments occur in Madhya Pradesh, Gujarat and Maharashtra. Groundwater extraction, which grew at 3 to 4% per year in the fifties, rose to an annual 19% in the late sixties, and has since increased by an estimated 150% (Bandyopadhyay, J. (1987). Political ecology of drought and water scarcity. Need for an ecological water resources policy. Economic and Political Weekly, December 12.). Conversion of natural forests in Malaysia into plantations has doubled peak run-off and cut dry-season flows in half. In the Amazon basin, the massive deforestation is expected to generate large-scale and probably world-wide climatic changes, including a reduced return of moisture to the air from evapo-transpiration and a reduced rainfall, and thus water availability.*
> *(UN Committee on Development Planning. Water, the fundamental resource.)*

Deforestation and over exploitation of groundwater have serious consequences for future sustainability: they **affect water, food and fuel,** three prime components of life of **which women are the main providers and managers.**. However, these developments often **remain hidden in official statistics,** since in many countries, food crops, up to 80% of which are produced by women, and water and fuel collection are not considered part of the national economy. **Water collection** is for example **included in the official statistics in only 6 out of 70 countries.** (Blades, D. (1975). Non-monetary activities and the national accounts of developing countries. Paris, OECD.) Until recently, and in limited ways, both economic analysis and policy have insufficiently recognized the complementarity of agricultural production and the natural resources base on the one hand, and water, fuel and food production on the other. The specific implications for women have been particularly neglected.

These implications arise firstly from the adverse effect of deforestation on agricultural output, particularly in the hills and other vulnerable environments, where trees hold water and soil for food crops and provide fodder, fruit, firewood, turpentine and other basic products, with women as prime cultivators and collectors. Tree cutting further greatly increases women's time spent for fuel collection from public lands.

> *In five drier states in India, woodfuel constitutes 91–100 percent of firewood consumed by small farmers and landless households. Moreover, women are forced to contribute to further environmental degradation primarily caused by commercial cutting of forests for industrial purposes and agriculture, because they can no longer collect twigs and small branches, but have to cut down whole trees as wood gets scarcer.*
> *(Agarwal, Bina (1988). Neither sustenance nor sustainability. In: Structures of Patriarchy: State, Community and Household in Modernising Asia. London, Zed Books, p. 83-120.)*

Water stress

The second man-made cause of **lack of water scarcity is water stress**, or competing demands for the same or diminishing amounts of water. **Increasing demands for irrigation are rapidly depleting the water from shallower sources used for domestic use and small-scale irrigation and cattle raising by women**, and is also threatening deeper water layers. Irrigation of sugar cane cash crops in Maharashtra, for example, has caused over-exploitation of 77 watersheds in 14 districts, and 49,000 tube wells dug between 1972 and 1983 have now fallen dry. As a result, more villages have become shortage villages, causing many women to spend time earlier used on food crops and family life to go farther and farther for water, and governments to spend more and more funds on basic services. (Shiva, Vandana (1988). Women and the vanishing waters. In Staying alive: women, ecology and development. London, Zen Books, 179-218.)

Other purposes for which **water is distributed** are industrial and domestic water supply. **Industrial** use presently accounts **for about 10%** of water use in developing countries and will accelerate, especially for power generation, paper milling, metal and chemical industries and mining in countries which do not demand the reuse or recycling of water. **For domestic water** in water short areas, **amounts collected by women** vary from the biological minimum of **2–5 liters to 11–20 liters per person per day**. To enable women to maintain decent standards of hygiene and reduce water-related disease, many people need to use considerably more water than they do at present. (Committee on Development Planning. op.cit.p.57.)

Water pollution

As urbanization and settlement density increase, so do domestic and industrial waste. **The unplanned siting of industries, the lack of safe disposal and recycling of industrial waste, and in rural areas, the increased use of fertilizers and herbicides, increasingly cause high surface and groundwater pollution** and massive costs to cope with the consequences. Where sanitation is absent, human excreta, domestic waste and sullage are disposed of at curbsides, in ditches or open water, on wasteland and farmland or, at best, in open pits and rubbish heaps. This directly threatens health and results in surface run-off with high loads of pathogens and organic materials. These contaminate both nearby surface water and the more shallow groundwater on which many women rely for the family's drinking water. (Fano, Enzo, et al (1986). Managing water quality in developing countries. Natural Resources Forum, 10, 1, 77–87.)

> *In Shanghai, for example, combined industrial and domestic waste now so much pollutes the Huang-pu river that for the sake of people's health there is no other choice than to move the water intake upstream to a cleaner place, at a cost of US $ 450 million. Meanwhile, how to solve the pollution problem itself still remains an enigma. (Chonghua, Z. (1989). Environmental issues in water supply and waste disposal. Paper presented at the Collaborative Council Meeting, Sophia Antipolis, November 28 - December 1.)*

1.7 Domestic water supply and sanitation services

While water shortages and pollution are threatening water resources availability and quality, sustainability of the supply of water and waste disposal facilities is also a growing problem.

Sustainability of the domestic water supply and sanitation sector refers to "the ability to keep up construction, functioning, use and benefits of improved facilities, without detrimental effects on the environment, also after special assistance has been phased out". (Adapted from Narayan-Parker, Deepa (1990). Participatory Evaluation. New York, UNDP/PROWWESS, p. 13.)

In Module II it was already seen how the involvement of women in planning and implementation can help sustain the construction of generally used water supply and sanitation systems in both engineering programmes and programmes for community self-improvement.

However, to sustain also the maintenance of the growing number of completed systems is by no means easy. Installation in ever wider and often inaccessible areas enlarges the problem of keeping all systems in working order. It is not rare to find that of all taps or

pumps installed, half are not working or working inadequately. Thus, users are forced to return to their old contaminated water sources, while having lost much of their former resistance to water-related diseases through temporary use of a better system. As a result, risks of infections increase rather than decrease, and earlier benefits are lost.

a) **Sustainability of rural water supplies**

Because few water agencies can continue to provide all human resource, transport and resources to keep each facility in continuous working order, many agencies now prefer **to make especially the smaller communities as self-reliant** as possible in running, maintaining and financing the operating costs of installed water systems, and in continuing the installation of latrines. In this way, the agencies can concentrate the bulk of their human resources and funds on ongoing construction, and for operation and maintenance of the larger water systems. **A smaller part is reserved for monitoring community performance** in local maintenance and management, for continued installation, **use and maintenance of latrines**, and for providing support to activities beyond local capacity. This requires, however, a different kind of project implementation and expertise, with more time, effort and skills to help communities make sustainable choices, and more support to build up the institutional capacities required, as mentioned in Module II, and discussed further below.

b) **Sustainable water supply in low-income urban areas**

Sustainable water supplies are no less **a problem in urban areas.** High urbanization rates mean the growth of especially the lowest-income sectors, which by the year 2000 are expected to account for half to three-quarters of urban populations. (UNICEF (1982). Some facts and figures on urbanization in the developing world.) While these **consumers can seldom afford conventional metered house connections**, the usual free standposts are also becoming increasingly unsustainable. To serve all people properly, too many standposts are needed, causing too great a demand on existing water sources and distribution nets, excessive running and maintenance costs, little opportunity for cost recovery and often high health and pollution risks, especially from infiltration of polluted water around standposts into intermittently operated systems.

For more sustainable urban services to low-income areas, there is a **need** to widen the range of **intermediate options between paid private connections** on the one hand and **free public standposts** on the other, and to match the needs of the users with varying financial and administrative solutions. Examples of intermediate service levels include (WHO. (1988). Managerial and financial principles for water supply and sanitation agencies. Report of the fourth Consultation on Institutional Development, Working Group on Cost-Recovery. Geneva, 21-25 November.):

- **shared private connections** and sanitary blocks serving socially cohesive clusters of **households;**
- **metered group connections paid** for and managed by a larger user group with its own **group committee;**

- **semi-autonomous systems**, such as piped water sold in bulk to a specific **neighbourhood** or group which organizes its **own distribution system**;
- **autonomous systems**, in which groups or neighbourhoods establish and manage their own, community-based sources and systems.

c) **Sustainable sanitation programmes**

One of the most **effective ways to reduce water pollution and preserve nearby fresh water resources is the establishment of domestic sanitation facilities.** At present, nearly **30% of the people lack proper excreta disposal facilities in urban areas and 51% in rural areas.** (UN Economical and Social Council (1990). Achievements of the IDWSS Decade. UN General Assembly Document A/45/327.) Geographically, the reported range of coverage for urban and rural sanitation varies from **26% for rural sanitation in Africa, to 100% for urban sanitation in Western Asia** (Table 2).

Table 2:
Percentage sanitation coverage by region, 1990

	Urban	Rural
Africa	79	26
Latin America and the Caribbean	79	37
Asia and the Pacific	65	54
Western Asia	100	34

Source: UN Economic and Social Council, 1990.

This poses a tremendous challenge to governments and project managers to reduce the gap between those with and without safe sanitation, and with a steadily growing population. They face the problem of expanding sanitation coverage at a reasonable speed of implementation with limited budgets, as well as insuring that established facilities are used and maintained.

Experience has shown that it is possible to construct large numbers of 'free' or highly subsidized latrines in a short period. However, it also shows that:

- **Subsidized latrines usually go to the more advanced households** who can often afford to install their own. In fact they frequently do so when no external programme is available (Wijk-Sijbesma, Christine van (1985), op. cit., p.50; Sundararaman, Veena

(1986). Social Feasibility study on the role of women in rural sanitation. Bombay, SNDT University, Research Centre for Women's Studies.);

- **latrines built without user** involvement in planning and without maintenance follow-up are often **not completed, utilized and maintained** (De, Jatin. (1987). Formulation study for most appropriate institutional set-up for implementing sub-project V, rural sanitation, with particular attention to community involvement and participation. Lucknow, Uttar Pradesh, Project Support Unit; Wegelin, Madeleen (1990). Building on local practice. The Hague, IRC);
- **continuation**, or expansion of the programme to other target groups is often **not possible under the same conditions.**

On the other hand, it is clear that where local capacity exists to create a demand and to promote, construct and install appreciated and affordable types of latrines, people continue to install them on their own initiative.

> *Examples of partially or fully self-sustaining latrine projects are the rural latrine programmes in Lesotho and Thailand, and the originally urban 'sanplat' in Mozambique. In Lesotho, the programme has trained already 900 local craftsmen, 20% of them women, in making latrines. The trainees then promote, construct and install latrines on their own, with an estimated present total of 12,000 (UNDP/World Bank and PROWWESS (1990). Rural sanitation is Lesotho: from pilot project to national programme.). In Thailand, the village health workers are often the ones who are trained, and who thereafter install water sealed latrines in their villages at a small profit (GTZ (1989). Sustainability and effective use: the case for community participation and hygiene education in water supply and sanitation. Frankfurt, German Agency for Technical Cooperation.). In Mozambique, local production cooperatives produce and market a smaller, more affordable, yet strong latrine slab which can be placed over a traditional pit latrine or VIP latrine. In all three cases, the input of the programme is mostly on research, including social research on acceptability, and on training, while the users pay part or all of the direct costs.*

2. *THE NATURE AND PURPOSE OF WATER DEMAND MANAGEMENT**

Water is an **indispensable factor in the well-being of people**, regardless of culture or nation. In all the various kinds of human settlements, few activities are as universal as the striving for adequate supplies of safe water. In the words of a **recent UN report:**

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* This section 2 to 2.3 is based on: UN/DTCD "**Legislative and Economic Approaches to Water Demand Management**". A strategy for the Implementation of the Man del Plata Action Plan for the 1990s, UN, New York, 1994. A report prepared by Prof. John Boland of John's Hopkins University in Baltimore.

"Abundance or scarcity of water can mean prosperity or poverty, life or death. It can even be a cause of war. Most countries have deeply worrysome problems concerning the quantity and quality of fresh water resources, and many countries are suffering from the effects of pollution of their coastal waters."

These issues and conflicts do not depend on any particular history, tradition or ideology. They affect industrial and non-industrial countries, market and centrally-planned economies, arid and humid climates. The specifics of each problem may change, but the prominence of water-related issues is a constant.

2.1 Demand Management

Through most of human history, managing water has meant managing water supply. **Water "needs"**, once determined are regarded as immutable: all management efforts are devoted to **locating and developing new sources**, and to transporting and treating the resulting supplies. Supply expansion is typically pursued until the "need" is satisfied, or to the limits of financial affordability and/or engineering feasibility. Water management, within its limited definition, is largely a matter of financing construction. Rather than seeking a supply adequate for some set of water "needs", **water management is concerned with finding an appropriate balance between the benefits of water use and the costs of water supply. "Needs" are no longer measured in cubic meters per day, but** in terms of the **health and well-being of human populations. Costs are not limited to cash outlays** for engineering and construction, but **include all adverse effects on the economy**, on activities which complete for the basic resources and on the environment.

Because of the considerable **scope of water management**, it is helpful to divide the subject into two categories: **Supply Management** includes the traditional activities required to locate, develop and exploit new sources of water in a cost effective way, while **Demand Management** addresses the ways in which water is used and the various tools available to promote more desirable levels and patterns of use.

2.2 Necessity for Demand Management

To the extent that **demand management** actions improve the overall management of water resources, they **increase the benefit** received from a **given use of resources, or they reduce the resources required** to achieve a **certain benefit**, or both. Some **common motivations** for **demand management are** (see Additional Reading):

- Increases in water use
- Deterioration in available supplies

- Increasing costs of developing new sources
- Critical water shortages
- Need for cost reduction in the water sector
- Reduced carrying capacity in water based environments
- Cumulative damage to water-based habitats
- Over-exploitation of natural water supplies

2.3 *Objectives of demand management*

Demand management is not a single tool or method, but **a collection of techniques,** each devised to deal with a particular aspect of water management.

Some of the more **common purposes of demand management techniques are:**

- Improved allocation of water among competing users
- Expansion of use into growth-promotion areas
- Increase in water sector revenues
- Postponement of new construction
- Draught management
- Reduction in unnecessary use and wastage
- Conservation of the resources
- Water quality control
- Sustainable development.

Full attention to these criteria requires comprehensive water management, including both supply and demand elements. Supply measures should respect the characteristics and alternative uses of sources, while demand measures insure that only the necessary amounts of water are used.

2.4 *Approaches to Water Demand Management*

To date, national efforts and external assistance in developing the water sector have focused predominantly on expanding and improving water supplies and extending services to unserved communities. This has been done through developing water sources and adding some means for water distribution, both conventional and non-conventional. However, evidence is mounting that the **conservation of existing supplies** through the management of water demand and more efficient management of water supply agencies is equally **important.** In many cases, the **cost of saving water is significantly lower than the cost of**

incremental supplies. (Arlosorof, S. 1989. Issues in water management. Paper presented at the ACC Intersecretariat Group for Water Resources, Tenth Session, New York, UNDP, 25-27 October.)

2.5 Limiting consumption and improving conservation

In order to cope with the growing demand for water against a stable or diminishing availability, we need to:

- reverse past trends in water consumption;
- find innovative ways of conserving, re-using and recycling water;
- develop new water resources, including rainwater harvesting, brackish water and treated waste water for some applications. (FAO (1989). Waste water treatment and reuse in the Middle East and North Africa Region. Rome, FAO.)

Limitation of water demand has the greatest potential in densely settled areas. **As water becomes more scarce and valuable, metering and monitoring of water use become cost-effective.** (Fano, Enzo and Brewster, Marcia (1988). Issues in groundwater economics. Natural Resources Forum, 12, 3, 267–273.) **Metering makes users more aware of the economic cost of producing and supplying water, and leads to considerable water conservation. However, it is only cost-effective when combined with proper budgeting, pricing,** meter reading, billing and tariff collection, and with the resulting funds returning to the water agency.

> *Under a progressive block tariff, the first block of water is supplied at a low, and often subsidized rate, to meet basic water needs. Subsequent blocks, which are used for more luxury domestic purposes, such as car washing, lawn watering and swimming pools, and for commercial and industrial purposes (restaurants, factories) are supplied above the real cost-price of the water, so that subsidies to basic users can be recovered. Increasing block tariffs exist now in 80% of the countries in Latin America, 66% of the Eastern Mediterranean and South-East Asia, over 50% of Africa and 40% of the Pacific. Canada and the USA, on the other hand, for the most part still apply declining blocks, illustrating how this is one of the areas in which developed countries have interesting lessons to learn from developing ones.*
> *(Katko, T. (1990). Cost recovery in water supply in developing countries. Water Resources Development, 6, 2, 86-94.)*

Public education campaigns, provided they are varied and linked to economic incentives, further help to make consumers better aware of the costs involved in treating and supplying high quality water and of the benefits of water conservation for both users and agencies.

People in the rural towns of a coffee growing area in Colombia continued to enlarge their water consumption to such a degree that the design capacity of the slow sand filters installed for low-cost water treatment was achieved already one year after their completion. Public education on the necessity and implications of water treatment, combined with economic incentives (metering, progressive block rates, and a first block equal to the original flat rate) helped people to accept the management measures and adopt more economic water use patterns, resulting in a substantial decrease in consumption and postponement of the need to expand the treatment system.

Allocation of **water quota** to each municipality or sector is **a further measure to limit water consumption.** The annual quantity of water allowed under a water quota system is the product of the number of people and a prescribed amount of water per capita. The quota system will stimulate the installation of water-saving devices, sound system management and progressive water charges to discourage excessive water use, since less water is allocated the following year when targets are not achieved.

2.6 Sustainable services in low-income urban areas

In low income settlements, metering of private household consumption is less feasible. Here, urban authorities increasingly turn to other, more innovative forms of supplying water and sanitation to low-income households, often on the basis of group- or community participation. Depending on the particular socio-economic, political and technical conditions, choices have included the following:

- **Agency-managed service stations.** These involve low-priced, agency-operated public toilet, bathing and clothes-washing facilities in low-income settlements characterized by a floating population, with some regular income from the informal economy, and little time and cohesion for community participation such as, for example, the service stations run on a no-loss, no-profit basis by an NGO in Patna and other Indian cities. (Vijayendra, T., 1980. Sulabh Shauchalaya Sansthan, a socially relevant small-scale industry. New Delhi, Public Enterprises Centre for Continuing Education.)
- **Community-managed service stations.** In more cohesive neighbourhoods, but where technical, political and/or economic reasons prohibit other solutions, locally-formed committees manage water vending stations ('kiosks') and bath-houses, with users either paying per visit or a fixed rate. Examples include the community-managed water kiosks in Ouagadougou, Burkina Faso, accounting for 23% of total municipal supply, (Bedek, P. and Morel, A., (1987). L'eau pour tous dans les villes africaines: innovations a Ouagadougou. Cergrene), water kiosks in Tegucigalpa, Honduras (Elmendorf, Mary and Kruiderink, Anton (1983). Promotion and support for women's participation in the IDWSS Decade. Report on mission to Honduras. New York, UNDP) and various towns in East (Wijk-Sijbesma, Christine van (1985). op. cit., p.74. 31) and Southern Africa, (Rivett-Carnac, J.L. (1984). Community water supplies for peri-urban areas. University of Capetown, Department of Civil Engineering) and community-managed sanitary

blocks in Semarang, Indonesia (Soepardjo Roestam, K., (1987). Women, environment and development. Jakarta, PKK.)

- **Community-managed neighbourhood taps.** Metered neighbourhood taps with community involvement in local design and location, and water use and user payments managed by locally formed tap committees, such as, the Communal Waterpoint Projects in all major towns of Malawi. (Carri, R. (1985). Manual for planning, investigation, design, construction and monitoring of communal water point projects. Lilongwe, Ministry of Works and Supplies and UNDP/WHO.AFRO/UNCDF.)
- **Urban group connections.** Small groups of ca. 3 to 10 households with close social ties share one metered water connection, or communal toilet, preferably with separate household cubicles, with the household in whose name the connection is registered responsible for collection of charges and internal control. Group connections in site and service schemes in Lusaka, Zambia, and group taps and latrines in Calcutta, Amravati and other Indian cities are examples. (Maitra, M.S. (1978). Sanitation for the poor. In Pacey, A., Sanitation in Developing Countries. Chichester, Wiley.)
- **Community-managed networks.** A local community organization buys water in bulk from the municipal authorities and distributes it through its own network to neighbourhood or member households. For sanitation, users are assisted by a local intermediary organization to install toilets in bulk and construct primary sewers at street- and community-level, with a connection to the municipal sewerage network and waste disposal plant. Examples are the neighbourhood distribution nets in low-income settlements in Latin America and the Eastern Mediterranean and the sanitation system in Orangi ward, Karachi, Pakistan. (IRC (1988). Community participation and women's involvement in water supply and sanitation projects. A compendium paper. The Hague/Paris. IRC/DGIS/DECD.)
- **Community-managed systems.** Low-income urban neighbourhoods build and manage their own small-scale water supplies from local water sources. Examples are peri-urban communities in Latin America which install and manage their own water supply, e.g. around Cali, Colombia, and in Brazil (Gosling, David (1975). Housing case study in Brazil. Architectural Design, 1, 38-41), and in Mexico where they manage their own waste water treatment plant (Schmink, Marianne (1984). Community management of waste recycling: the SIRDO. Seeds Pamphlet series, no.8. New York.)

2.7 Community involvement in rural settlements

In the **rural sector, water consumption is usually limited by installing communal taps or handpumps**, but communities can play a valuable role in managing water demand and limiting water losses by maintaining the intake and distribution network, and managing communal waterpoints. If nobody is responsible, **taps get left open or vandalized, and drains and soakpits become clogged.** Communities cannot do this, however, without proper backing and monitoring by the water authorities responsible for the overall water situation in the area.

Where development goes further, and house connections and simple treatment systems, such as slow sand filters are installed, community management demands increase. **Public education is a need for users, and especially women,** to understand that an affordable filter has a limited capacity, and water cannot be wasted. Local water organizations, **women's clubs and schools play a key role in this education,** and local water committees can organize surveys to check whether all connections have got **proper taps and waste water disposal arrangements.**

> *One such community survey in La Sirena and Los Mangos, Cali, Colombia, revealed that 40% of the households were not connected to the community water supply, and that only 21% had adequate waste water disposal. Methods of excreta disposal also left much to be desired. As a result of the low coverage, individual water rates were higher than necessary and health impacts, despite the community's treatment plant, unlikely to occur.*
> *(Hazenberg, Mary (1989). The application of a questionnaire survey with community involvement in La Sirena and las Mangas, Cali, Colombia. The Hague, IRC and Cali, CINARA.)*

Negative impacts on socio-economic conditions

Where rural communities decide to install water meters to manage water demand further, great care is needed to make certain that capital and recurrent costs are borne by those creating the demand for metering. The latter are usually the more wealthy households, who have a much higher domestic water consumption and also often use water for small-scale productive purposes, such as animal breeding and horticulture. In those cases, the extra costs of installing and reading meters should not be borne by the small consumers, who should continue to pay the same tariff for their basic water consumption as before.

There is however, a need for full transition towards cost-recovery, which should be undertaken by the local community, and an assessment of methodologies should be made.

3. MANAGEMENT OF WATER QUALITY

Management of water quality is mostly an area for the water and health authorities. Fano and others (Fano, et al (1986). op.cit. p.82–84) plead for a three-pronged strategy on a firm legal foundation and within a country's national programme:

- **environmental impact assessment** before beginning a new project, to predict its influence on environmental resources, including water quality;

- **economic incentives** to stimulate polluters to reduce their pollution. These can be effluent charges, or tax reductions on investments in pollution control, or to site industries away from urban concentrations;
- **pollution control standards.**, specifying either the minimum water quality standards to be met at a specific site ('ambient standard') or the mean or maximum permissible discharge of a polluting product from a particular source ('effluent standard').

Community participation in water quality control can play a role especially at the lowest levels. Community management can include the **protection of the water source and preservation of hygiene and reuse of waste water collection points.** In Colombia, for example, a water quality vigilance programme is under development, whereby community water supply operators are trained to monitor water quality using simple methods and equipment for checking water turbidity, residual chlorine and faecal coliforms.

A large contribution to **water quality control** comes further from the **installation and use of excreta, waste water and solid waste disposal facilities.** At the village or neighbourhood level, community involvement is essential in the analysis of local waste disposal problems and the finding of locally appropriate solutions, especially since without such problem identification, waste disposal is usually perceived as a lesser problem than water supply. (Goodhart, Lucy (1988). Twenty lessons learned from social feasibility studies. New York, PROWWESS/UNDP.)

Discussions on water and latrine use in a Tanzanian village meeting brought to light that while almost all families had access to a piped water system and a operating latrine, they had no such provisions on the farmland where they stayed during the planting and harvesting season. The meeting thereupon concluded that they would build also simple latrines in their farming areas, to prevent excreta from being washed into the small streams and ponds which they used for drinking water. In another case, in rural Colombia, the river water was so polluted by animal excreta that the village slow sand filtration plant could no longer manage the load of bacteriological pathogens. Suggestions from the water agency's field staff to fence off the intake area, or graze the cattle elsewhere were rejected by the community as unworkable. There was no other grazing land and the barbed wire would get stolen. Instead the village proposed to mobilize its male population and plant prickly vegetation above the intake area to force the cattle to drink downstream. This suggestion was taken on and proved to be effective in the particular circumstances.
(Wijk, Christine van. pers.obs.)

4. *ROLES OF WOMEN IN WATER AND SANITATION MANAGEMENT*

4.1 Forms of women's involvement

In view of their most direct interest in improved water supply and sanitation, **women** often **play a large role in innovative approaches to management of water and waste,** especially at community or neighbourhood levels.

Low-income urban areas

In **low-income urban areas,** women have been reported to take part in water supply and sanitation management:

a) **as members of local committees that manage communal taps or sanitation facilities.** In the peri-urban communal water points projects in Malawi, women play a big role. In Salinas,for example, 53% of tap committee members are women and 58% of the committees are chaired by women. They look after the taps, collect user payments, control proper use of water, and often plant flowers around the waterpoints to make them more attractive. Women's participation in tap management closely reflects the approach taken by the original project teams in establishing them. When mostly men are contacted, committees are dominated by men. When the teams consulted more women, the committees reflect this with more women still active, since they have a feeling that it is their project. (Kwaule, Fabiano (1986). Public standpost water supplies project. Preliminary field report. Lilongwe, Ministry of Works and Supplies and IRC.) In Semarang, Indonesia, women take part in the local committee that manages the 15 communal toilets for women and 13 for men. The committee employs and supervises the two employees (cleaner and fee collector), checks payments, and manages funds. By collective decision, the project's revenue balance is used for repairs, garbage collection and street paving. (Soepardjo, K. (1987) op. cit.)

b) **as organizers and managers of water vending** ('kiosk system'). United by their need for reliable and affordable water, and their dislike of high water prices from private vendors and licence holders, women in low-income urban neighbourhoods in Honduras, Burkina Faso and Kenya have taken on and managed their own licensed water vending points. Characteristics reported are a lower and fixed water price, provision of part-time employment to poor single women with children, and use of the group's surplus for neighbourhood projects. (Wijk, Christine van, op.cit., p.74.)

c) **as organizers and managers of neighbourhood water supplies and sanitation systems.** Poor urban women in, among others, Kenya, Brazil and Mexico, united by their needs for both water and income, helped organize either their own local water supply, or financed a connection to the municipal network. Water is used for income generation from beer brewing, teashops and a launderette.

d) **as promoters and managers of household latrines.** Once women in the low-income urban neighbourhoods of Baldia and Orangi, in Karachi, Pakistan, were involved in the projects, they made very effective voluntary promoters of on-site (Baldia) and off-site (Orangi) sanitation systems. (IRC, (1988) op. cit.) In a rural programme in the same country, paid male and female sanitation promotors receive 3 months' training in the construction of latrines, cisterns, soakpits, biogas plants, protected wells and small water supplies, food hygiene and soapmaking. The female promoters then form Ladies Motivation Teams in their home areas and visit and work with the local women in constructing and maintaining latrines, building water cisterns, etc. (Tilani, Mahmooda (1984). Case study from Pakistan. in The Local Decade, The Hague, IRC, p. 68–72.)

e) **as participants and managers of urban waste collection and recycling.** In China, women take care of the voluntary collection of human waste in their neighbourhoods. The municipality subsequently collects the waste from the local depots for central recycling outside the city. (Schenk-Sandbergen, Loes (1975). Explorations in Peking, Shanghai, Tsientsin and Tangshan, University of Amsterdam, Institute for South and South-East Asia.) In Mexico, women are the main participants in the cooperatives which manage the earlier mentioned community waste recycling plants. An elected committee operates, maintains and finances the operation and maintenance of the plants. Women of the first community also gave promotion and training on waste recycling to the second one adopting a plant. Compost and treated waste water are used to grow vegetables and the surplus compost is marketed. Surplus proceeds have been used to make a children's playground, and women in the group have united to buy food collectively from the wholesale market.

The potential for active contributions from women to waste recycling in densely settled areas is still very large. In The Netherlands, for example, one of the most densely settled countries in the world (384 people per sq. km in 1970), 60% of all paper, 55 % of glass used for household purposes and 25% of domestic chemical waste is already collected by local voluntary associations (paper) or brought to central collection points mostly by women (glass and chemicals), to be processed for reuse on a commercial basis. (Note regarding prevention and recycling of waste material. Ministry of Housing Physical Planning and Environment, October 1988 (in Dutch).

Management in rural areas

When women are involved in management in rural areas, it is mostly in management of water use and hygiene at water points and as members of local management organizations (Table 3).

Table 3:
Forms of participation of women in local management and maintenance

Site management
- as individual users, based on traditional norms and social control;
- as members of user organisations;
- self organized;
- organized by women's organizations;
- organized by project

Caretaking
- as members of male-female teams with culturally appropriate division of tasks;
- as caretakers doing both technical and non-technical tasks

Local administration
- as members of mixed management committees;
- in separate management committees for men and women

Self-reliant systems
- service operated, managed and maintained by women

Adapted from: van Wijk, 1985. op.cit., p.66

Site management

As managers of communal water points, **women are concerned with drainage and hygiene, proper use of taps and pumps, prevention of damage by children and livestock,** and they increasingly execute preventive maintenance and simple repairs.

In some cases, traditional norms and social control on the use of communal sources and the sense of communal ownership of new facilities are strong enough to guarantee that individual users take care of the proper use and management of the site. Often, the manner of use is a form of management, as it protects the durability or quality of the source. In rural communities in Botswana, "no-one fetching water from a well or hafir surrounded by a thorn fence would think of leaving without replacing the thorn bush which serves as a gate". (Fortman, L. (1982) Managing seasonal man-made water sources: lessons from Botswana. Waterlines, 1, 4, 22-25.) It is likely that such rural patterns are stronger in places where the water culture is high and when users have been closely involved in the establishment of new water supply.

In other cases, **satisfactory site management has been achieved through the organization of women users.** Sometimes, this is a spontaneous initiative of the women themselves, presumably based on traditional arrangements. For example, in a village in

Zimbabwe, the women themselves organized the use and upkeep of the communal water point, and its bathing and washing facilities. In peri-urban areas in Zambia, the women's branch of the political party organized the women on a case-to-case basis to improve the drainage of public taps. In other cases, water, health or community development staff made arrangements with the users concerned. In Malawi, tap committees composed mainly of women have been established by the implementation project. Well committees have been formed to supervise use of protected wells. Women have also been encouraged to use the pipeline routes as paths and to report leakages to the village caretakers.

Caretaking

Where **women** have been **involved in maintenance**, their role has been closely related to their traditional management tasks. They have been particularly involved in **preventive maintenance and the preservation of site hygiene and the control of use at the source.** In some cases, arrangements have been made spontaneously, thus preserving their original tasks as users and informal managers. In other cases, special tasks have been formulated in consultation with the agency. These have varied from appointment of a nearby women to look after the water point, to a site committee, user roster, or a team of a male and a female caretaker, with the woman responsible for hygiene and the man for technical matters.

System management

As members of mixed **water management organizations** comprising both men and women, **women are involved especially in financial aspects**, e.g. as treasurers and rate collectors. For example, in two provinces of Colombia, 43 out of 374 administrative committees had a woman member. Of these, 42 were treasurers and 1 president. Female treasurers are also reported for water projects in Nigeria, Kenya, Uganda, Zimbabwe and Panama.

In areas with segregation between men's and women's life spheres, or where female seclusion is practised, often projects either have formed **separate women's committees for local water management**, or the women themselves have preferred to form their own committees, for example in the Gezira area in Sudan.

Women in a Mexican community, united in their dissatisfaction with the functioning of their water supply system, established a separate "Gran Commission" to oversee the work of the community water board. In Honduras, the women who had initiated and established a water project in a low-income urban neighbourhood, thereafter asked the men to form the majority on the local development board, while they themselves continued to run the sectorial committees on drinking water, sanitation, and education. In an irrigation project in Indonesia, the women mediated in conflicts and collected rates, but were not represented officially on the local management committee.

4.2 *Experiences with women's involvement – strengthening effective management*

In recent years experience with community management of water supply and sanitation and of women's involvement therein is increasing. Review of reported experiences gives rise to a number of general observations.

A first observation is that traditional management arrangements by women are utilized insufficiently. Studies of women's roles in maintaining traditional water sources indicate that women often already **manage water sources** carefully **when** (Santa Cruz, Mario pers. com.):

- **water sources are scarce;**
- **sources are shared** among a closely-knit group of households;
- **socio-religious concepts** exist concerning water purity and hygiene.

Group regulations and social control on use, upkeep and hygiene are reported, for example, from parts of East and West Africa, Indonesia, Sri Lanka, Guatemala, Western Samoa and Papua New Guinea.

Traditional management, often remains **hidden,** however, partly because of its **informal character** and partly because **emphasis is laid on domestic** rather than public **aspects of water use by women,** and because **socio-cultural distance and restrictions** often **prevent** more **direct communications on water use and management between** external **technicians** and local **women.** (Wijk-Sijbesma, Christine van, 1985, op. cit, p. 27.). Bypassing traditional management arrangements can mean a great loss of resources to the project, as was the case in Western Samoa.)

> *In Samoa, members of traditional women's committees used to sit in the open walled watch-houses near the village water sources, supervising washing and bathing and weaving their mats. In the 1930s, these traditional women's groups were involved by the island's health staff in preventive health. The committees effectively organized refuse collection and home visits to monitor housing conditions and latrine maintenance, organized monthly health clinics and raised funds for construction and maintenance of water supplies. With the formal introduction of primary health care, their roles were taken over by paid health inspectors, mayors and nurses. The women's groups lost their motivation, and health costs and problems (filariasis, malnutrition) have increased.*
> *(Schoeffel, Penelope (1982). Dilemmas of modernization in primary health care in Western Samoa. American Anthropological Society, Meeting on anthropology and the delivery of primary health care, Washington D.C., 4-7 December.)*

Project staff involved in improving water supply and sanitation **can learn** much more about the presence of traditional management, and make use of them also for maintaining

new water points, **if they ask how traditional management is arranged, and not who is responsible.**

> *In many community meetings, when people are asked who takes water supply decisions, the answer almost invariably identifies male political-cultural leaders. But if questions are rephrased, focusing on how productive decisions are made, the answers ("the women are responsible for this" or "the young men take care of that") begin to reveal the existing local management systems. For areas where traditional communal orientations have begun to break down or did not exist to begin with, the same focus on "how" helps define responsibility and power within the household and extended family production systems.*
> *(Roark, Paula (1986). New participatory frameworks for the design and management of sustainable water supply and sanitation projects. Technical Report 52, WASH and PROWWESS, p.10.)*

A **second observation** of community management is that **effectiveness of local management is related to the degree to which women concerned are involved** as a group in making locally appropriate arrangements. Also **important** are the **clarity of rights** and duties, the **involvement of women** in **making management decisions,** besides doing physical work, and for good two-way communication with other parts of the local management system. Experience reported in the literature indicates that for site maintenance to be effective the community should be first involved in project planning, and later in making detailed arrangements for upkeep and maintenance.

> *Evaluations of two hand-pump projects in Malawi showed that well committees formed to maintain site hygiene neglected their work in many cases. This has been attributed to a low feeling of community responsibility from lack of participation in planning and community decision-making. People had only participated in the physical work of digging and in the construction of the apron, drainage channel and washing slab.*

A clear agreement on the **duties and rights of the village committees is also important.** Female handpump caretakers in Karnataka, India, for example, got little response and support from their communities, probably because its members has not been involved in planning of and information about the caretakership. Therefore, more attention is now being paid to community involvement, the local planning of well projects and in site management, and to the supervision of these arrangements by mixed village committees.

One outcome of the discussions on the duties of management committees was that villages do not question whether women should be involved, but whether men should be involved. Another outcome was the good site hygiene perceived during field-work in the area, for which the women members of the village committee are especially responsible.

Although women's groups have been quite effective in carrying out tasks assigned to them, **greater benefit** would be derived by projects and users, **if these groups** were also **involved in management decision-making.** This refers particularly to the organization of the work and the use of water at the source.

In a project comprising primary health care, water and sanitation in 60 villages in Danfa, Ghana, village health committees planned and implemented the local project together with the project staff. For village refuse collection, separate women's groups were formed. Although they carried out the allotted tasks in a satisfactory manner, the work was disrupted during the agricultural season when women are particularly busy in the fields. In Malawi, a tendency has been found in some areas to impose rules on tap committees instead of involving its members in management decisions. General rules have been established by the water department, but local headman have added their own rules, such as tap water should not be used for purposes other than drinking and cooking. This has led in some places to 60% underuse and continued use of traditional water sources for washing and bathing, thus perpetuating the risk of schistosomiasis. At other taps, collection of water for brick making, house plastering, vegetable gardening and other productive purposes has been permitted.

Improved two-way communication would also **make women's involvement** in water and sanitation **more effective.** If women are expected to contribute to maintenance by reporting problems, they need to be kept informed by local operators or management committees on matters of relevance.

When the taps in Zomba, Malawi, gave no water, over 80% of the users interviewed stated that they had not taken any action because they thought that project staff were cleaning the water storage tanks. Only a few reported that they had contacted their committee or that they had followed the pipes to detect leakages.

Basically, this is a matter of recognition of the contribution of women to preventive maintenance and optimum water use as part of the total water supply and sanitation system. Their participation is achieved more easily at the lowest community or neighbourhood level

than at higher levels, but this is not effective when no links exist with higher-level management.

One condition for better two-way communication and more influence in management decisions regarding women's issues would be a change in attitude of the higher management levels. Another option would be to involve women at higher levels, with the specific task of communicating with site organizations and users in general. Steps in this direction are now being taken in among others Tanzania and Malawi.

A **third observation** on community management concerns the **choice between mixed, or all-women committees.** Although separate women's committees are sometimes an advantage, they have not always assured that women have a role to play in management decision-making. Moreover they sometimes imply that women have to carry the full burden of maintaining community water supply by themselves.

In more segregated societies it is not clear whether preference should be given to integration of separate organization of women. There is a number of examples of women and women's committees being neglected in planning and management decision-making by local leaders and project staff, e.g. in Malawi and Sri Lanka, where local committees with women were installed from higher level committees where actual decisions were taken.

> *In some villages in Pakistan, women's committees have been reported to have met only on the initiative of the men's committees. Other women's committees were not affected because distance between households made it difficult for the women to obtain permission and time to meet. On the other hand, women's committees in rural development in the Gezira irrigation scheme in Sudan were said to work well, and often better than those of men. Therefore, it was considered preferable in a similar scheme, that both water and health committees be composed of women. Separate women's organizations in an environmental sanitation project in New Delhi, India, organized health education meetings on child care and sanitation. Each organization also elected a representative as member of the executive committees of the neighbourhood councils managing community development projects. The councils were especially effective in improving water supply and sanitation conditions.*

There is evidence that the women themselves know best which is the most appropriate approach in their society. Contributing factors to the success of either mixed or segregated organizations seem to be that the women are aware of their common interests, have united, and receive the support of the project.

A **fourth observation** concerning women's involvement in water and sanitation management is that **more data and documentation are needed** on the positive impact of this participation, for example, on the **the quality of preventive maintenance, the length and frequency of breakdowns,** the financing of recurrent costs, the upkeep of hygiene and the taking of new development initiatives.

There is growing **qualitative evidence** that in both site and system management, **women make special efforts to keep waterpoints clean and systems functioning.** For example, in a review of 324 handpumps in two water projects in Bangladesh, 11% more female than male caretakers reported that they clean platforms regularly, and of those doing this two or three times a day, many were women. (MIDAC (1984). A comparative study of the caretaker system of the Department of Public Health Engineering/Unicef rural water supply programme and that of the Bangladesh Rural Development Board's village health workers project. Dhaka, Unicef and Danida.)

Experience from water projects in Kenya, Panama, Mexico, Burkina Faso and Tanzania also indicate that women involved in formal or informal management make special efforts to solve local problems, such as ensuring the adequacy of supply, the repair of breakdowns and the collection and use of funds for maintenance. (Kunguru, Julia (1989). Sustainable water supply and sanitation in rural areas. Collaborative Council Meeting. Sophia Antipolis, November 28–December 1, 1989.) Support of these findings from longer-term monitoring of maintenance and financing performance is now needed, and will be further discussed in Module V, Monitoring and Evaluation.

A final observation is that use and building of local management capacities throughout the whole project cycle **does not yet take place sufficiently for local organizations** to manage completed water systems, sanitation and hygiene.

In the review of local management experience with community water supplies in Latin America and Southern Africa, Espejo draws the following conclusions (Espejo, Norah (1989). op.cit.):

- **users and committees often do not fully understand** the duties and responsibilities of a local water management organization;
- **project agencies overemphasize their functions of inspection and control,** while problem-solving, decision-making and negotiation get little attention;
- **women do not yet fully take part in local management decisions,** even though they are the domestic water managers in their communities and official regulations may account for their presence on village water committees;
- **construction** rather than proper management of completed systems is **still the main goal** of many projects;
- **maintenance problems arise both from factors located within the agency,** such as authority and execution in the hands of central rather than local authorities; institutional weaknesses preventing execution; lack of reliable supply of spares, and the community (lack of knowledge and skills for operation, maintenance, repair and financing; socio-political problems).

Implications of these conditions for institution building and training at the community level have already been discussed in Module III, Education and Training.

4.3 Women, water resources and environment protection

In water resources development and environmental protection, women are at present more victims than actors. Because women are in charge of domestic water and fuel provision and the production of foodcrops, they directly notice and are adversely affected by current negative developments.

> *Women in Zimbabwe, for example, report: "Many water sources have been destroyed, because the kind of cultivation of* **vleis** *and streambanks has led to drying up of wetlands and siltation of rivers. As a result, life for many women and children has become a constant drudgery of carrying water over long distances". They also note how ecological problems are acerbated by mono-cultural cropping, overuse of water sources due to population growth, siltation of existing boreholes from over extraction of ground water, commercialization of wood fuel, lack of feedback between the local authorities and the people, and men being chosen to represent women on issues which men do not relate at all.*
> *(African Women's Assembly (1988). What Zimbabwean women are saying; Report on national workshop of women and sustainable development in preparation for the African Women's Assembly in support of the Cairo Programme on the Environment, held at Belvedere Teachers' College, 15-16 August 1988.)*

Major policies concerned with structural adjustment as, for example, increased cash cropping, higher food prices and reduced spending on basic services, directly and indirectly affect women's environmental interests, and the way they are able to respond. (DAC Expert Group on Women in Development (1988). Women and Environment. Room document no. 3, Paris, OECD.) For example, where erosion and commercialization of wood products cause a shortage of wood fuel for domestic use, women must use less suitable biomass substitutes such as cattle dung, straw and crop residues. These then cannot be used as fertilizer, which seriously affects land fertility and reduces agricultural output. (Boesveld, Mary (1989). Planning with women for wise use of the environment: research and practical issues. Paper presented at the International Conference on Wetlands, 'The people's role in Wetland management', Leiden, 5–8 June.)

a) Exclusion of women from land-and water-related projects

At present, **women** are still often **excluded from both environmental and river basin development projects.** For example, projects related to soil conservation, agricultural extension (to practise safer farming techniques), and credit for water conservation activities seldom consult women and women's groups, and do not extend their activities to women. (DAC (1988). op. cit., p.5–6.)

River basin development projects have neglected traditional systems of food production, in which a wide variety of crops, livestock-rearing and fishing ensured a balanced

diet and prevented malnutrition from very limited types of food. In most **irrigation projects, lands and water rights are vested in the male head of the household, leaving the women no land and water** to grow the staple food and vegetables essential for family health.

> *In an irrigation project for rice cultivation in the Gambia, for instance, although women customarily grew rice in swampy inland depression, all irrigated plots were allocated to men.*
> *(Dey, Jennie (1983). Women in rice farming systems with a focus on Africa. Rome, FAO. In Mwea, Kenya, no land was allotted to women to grow the family's daily food. Hanger, J. and Moris, J. (1973). Women and the household economy. In R. Chambers and J. Moris, eds., Mwea, an irrigated rice settlement in Kenya. Munich, Weltforum Verlag.)*

Irrigation schemes and river basin development project have also increased the daily workload of women, and here given rise to incidences of malaria, bilharzia and river blindness, significantly affecting women because they spend long hours weeding in stagnant water. (Mascarenhas, Ophelia (1988). River basins and sustainable development. African Women's Assembly, Programme on the Environment.)

> *Although women in the Volta river basin in West Africa customarily collected all domestic water and produce the family food on their own plots, they did not get their own land in the new settlements. Water points were either not included, or located outside the settlement for technical reasons or from fear of contamination, with serious consequences for the time women spent for water collection. To compensate for their loss of land, women took up animal breeding, which further increased their water collection burden. Review of sex- and age-related incidence of river blindness showed high rates of infection in women and children for those forced to use river water for washing, bathing and laundry.*
> *(Bissiliat, Jeanne (1978). The role of women in the onchocerciasis programme area. Rome, FAO.)*

Although as a direct effect the incomes of tenants in river valley projects such as Mwea and the Volta river have increased, these benefits must be set off against longer-term negative impacts on water resources and land fertility, as well as on the countries' food crop production, family health and nutrition. The scope of such impacts on national economies is illustrated by the fact that in Africa and Asia, rural women produce 60–80% of the food, in Latin America and the Caribbean 30-45% and in North Africa and the Middle East 35%as seen also in Module I. (Boesveld, Mary (1989). op. cit.)

b) Advantages of women's involvement

More involvement of women in the planning and implementation of water resources and environment-related projects has a **number of potential advantages** for the women as well as the countries themselves. These include (DAC (1988) op. cit. p.6-7):

- **more effective projects** through use of women's knowledge and commitment;
- **visible environmental change;**
- **additional income earned by women,** which they often use for primary family needs;
- **reductions in family size** from more economic security, which indirectly result in the reduction of pressures on the environment;
- **improvement of women's self-image** and bargaining powers;
- overcoming some of the limitations of sectoral thinking and contribution to **reduction of unplanned negative project effects on environmental resources, nutrition and health;**
- **providing new areas for cooperation** between donors, implementors and NGOs involved in people's development and environmental protection.

c) Forms of women's involvement

In environmental protection of water resources, **women** have so far been mostly **involved in maintaining hygiene around water points.** Conditions which influence the effectiveness of women's involvement in this form of environmental protection were already discussed as part of overall management of domestic water supply systems in rural and low-income urban areas.

Use of women's environmental knowledge is another way in which water resource and environmental protection **projects can be improved.** This knowledge has grown from their long experience with their physical environment. Thus, traditional foodcrops in India, such as jowar, bajra and pulses, use less water and have a higher nutritive value than modern rice varieties. (Girriapa, S. 1983, Water use efficiency in agriculture. New Delhi, Oxford University Press.) Women in rural India, for example, categorized plant species in terms of their water conserving properties: root system, crown morphology and physiology, which are adapted to the hydrological conditions prevailing in the tropics. (Shiva, (1988). op. cit., p. 206.) In a dry area in Kenya, women advised an NGO project as to which species of indigenous trees were most suitable to grow for fuel, timber and fruits. (Wijk-Sijbesma Christine van (1987). Report on visit to AMREF. Nairobi, Kenya, 25–28 January.)

With regard to economic use of water resources, such indigenous trees and crops are often preferred over those planted commercially in more fragile ecological areas. An example is the fast-growing Eucalyptus, whose high water intake and insignificant contribution to humus formation has contributed to increasing water famine in Gujarat and Karnataka. (Shiva, (1988). op. cit., 207.)

In a small number of cases, women are actively involved in the implementation of environmental projects and prevention and repair of environmental damage. Some groups, such as, the growing women's movements in India and Kenya, are initiated and organized by the women themselves, as a protest or answer to a crisis by relatively united groups of women, who see their life resources (forest, farming land) threatened by commercial exploitation and deforestation. (Chipko Movement, India), or encroaching desertification (Green Belt Movement, Kenya).

> *Beginning September 16, 1986, rural women in the Doon valley started a 'chipko' (blockade) to stop mining operations in their area. They set up the blockade on the banks of the Sinsharu Khala river, the stream which was the lifeline of the village and whose source had been exploited for mining for 20 years. The mine destroyed the forests and with them the water sources. Twelve springs in the vicinity of the mine have gone dry, and two years ago, the perennial waterfall also dried up. The stream is a wide, barren bed of limestone boulders. The water mills, paddy fields and forests on the river banks - all have been washed away.*
> *(Shiva (1988) op. cit., p. 208.)*

In other cases, environmental protection and regeneration projects are started as food or income-generation projects for poor people, on the initiative of external agencies, or as a result of the needs identified by the local women themselves. **The first such projects** often only **involve women as cheap labour,** and **not as important sources of information** and environmental management. Further, they often make it **difficult for poor women to participate,** because local leaders and project staff think the work not fitting and suitable for women. Yet investigations show that women who participate, belong to the poorest families, often without male income-earners, and they perform all tasks. (Chen, Marty and Ghuznavi, Ruby (1977). Women in food for work: the Bangladesh experience, Dhaka, WFP. Tomoda, Shizue et al. (1987). Women and special public women programmes. Geneva, ILO.)

The projects with real participation of women based are on active problem and needs identification by the women themselves, and involve women also as planners, trainers and managers. They are mostly carried out by non-governmental organizations and have had so far been implemented on a marginal scale.

d) Implications for projects and policies

To counteract current deterioration in environmental resources, the DAC Expert Group on Women in Development points out the importance of the economic and political advancement of women, so that they can better pursue environmentally sound practices. Further, more research on indigenous and environmentally sound experience and land- and water use practices is advocated. Women's roles in the countries' food production and their links with water- and land use should also be more widely acknowledged and publicized.

At **the country level**, the DAC Committee recommends the **preparation of country programmes and reviews**, and the formulation of national conservation strategies, which include **an analysis of the position of women on environmental management.** This would also give the countries a stronger base on which to negotiate for new projects.

At **project levels**, the committee emphasises that **environmental impact assessment by environmental or women-in-development advisers** should become part and parcel of the appraisal of projects concerned with water and/or land use. Results should be used in deciding the composition of project teams and in designing and implementing projects. Particular aspects to consider at would include:

- the likely **impact of the project on the environmental interests** of the various categories **of women in the area;**
- **the implications of environmental projects for women** (for example, resource rehabilitation, genetic conservation, pollution reduction, income-generation);
- **how women as environmental managers can be assisted** (e.g. by special training, equipment, credit);
- **how traditional knowledge can be safeguarded and used.**

Agencies can be progressive as well as reactive here. Scope exists in particular for demonstration projects in 'primary environmental care', either as separate action or training projects, or as part of settlement, agriculture, forestry, domestic water supply and other sectoral developments. Some agencies already have special funds to do this; others should consider establishing them. (DAC (1988). op.cit., p.9.)

Other points for consideration include methods for making ecological projects with women less marginal, and ways to support more small-scale participatory water and land use management projects. Preferably, however, all water management activities should take place under an umbrella system for river basin management as a whole. (Alvaro Romirez, H. (1989). Water resource management issues of water supply and sanitation. Sophia Antipolis, Collaborative Council Meeting, November 28–December 1.) In planning and implementation, local people, both men and women, should be involved more actively and as managers of their own development projects. Evidence favouring this type of locally managed conservation comes, among others, from a comparative study of two water resources development projects in Sokoto, Nigeria.

Causes and failure of large-scale irrigation schemes developed in the 1970's were analysed and compared with a much smaller initiative to floodplain water conservation in 1917-21. In contrast to the typical large-scale, top-down development approach, the earlier effort shows many of the features of sustainable development advocated today.
(Adams, W.M. (1987). Approaches to water resource development, Sokoto Valley, Nigeria: the problem of sustainability. In: Conservation in Africa, people, policies and practice. Cambridge, Cambridge University Press.)

Some reluctance on the part of both external support agencies and recipient governments to include the relatively new areas of water resources management, environmental protection and women's involvement into the already complex administration of rural development projects is understandable. Even so, progress in this regard is essential if irrevocable damage to the sustainability of rural and urban development in the longer run is to be avoided.

5. *ECONOMIC TOOLS FOR DEMAND MANAGEMENT**

It is customary for public water systems to rely charges on those who receive water service. Several kinds of prices, fees and assessments may be applied as specified in the **water tariff.** Where meters are installed, at least part of the total charge is based on metered water use. Other tariff **elements may be fixed or** they may **be based on the type of water user served,** the size of the water user's property, the value of the property or the number and type of water using fixtures installed. The **simplest** possible form of water **tariff is a fixed charge levied each month on each water customer. Another possibility,** applicable to metered customers, would be a **price per unit** of metered water use. **Both** of these are described a **single part tariffs,** since each contains only one type of charge. If these charges were combined, so that each customer paid a monthly fixed charge as well as a price for metered water, the results would be a **two part tariff. Multi-part tariffs may have two, three or more components.**

Additional economic incentives for demand management which can be implemented outside of the structure of a tariff are more narrowly focused and more flexible than tariff provisions. They include: **economic tools** for management of **domestic demand** (difference between metropolitan areas and small communities; incentive payments for water use modification; voluntary quotas; flow restrictions; landscape subsidies; **economic tools** for management in **agriculture** (production projections; incentives for purchase of low water using irrigation systems; penalties on surcharges for polluting the supply; incentives for use of lower-quality water; introduction of low water-using crops; incentives for changes in land-use patterns); **economic tools** for demand management **in industry** (tax rebates on recycling on waste treatment equipment; high-use surcharges, penalties and fines for polluting industries). (See Additional Reading.)

* The section 5 is based on: UN/DTCD "Legislative and Economic Approaches to Water Demand Management". A strategy for the Implementation of the Mar del Plata Action Plan for the 1990s, UN, New York, 1981 a report prepared by Prof. John Roland of Johns Hopkins University in Baltimore.

6. *SUSTAINABILITY AND LOCAL FINANCING*

6.1 Lack of funds for operation and maintenance

A major difficulty facing many countries in operating and maintaining installed systems and expanding latrine coverage **has been lack of financial resources.** To maintain, repair and eventually replace the current levels of 5000 handpumps in Burkina Faso, for example, would require an estimated annual budget of F.CFA 300-378 million (about US $ 1 million), which is 70 to 80 times the total 1979 annual budget for installation and maintenance of pumps. (Bastemeijer, Teun and Visscher, Jan Teun (1985). Maintenance systems for rural water supply, state of the art. The Hague, IRC.) In India, estimated costs of operation and maintenance of piped rural water supply for 300 million people and handpumps for 200 million people are equivalent to 37% of the total budget for rural water supply expansion under the 6th Five Year Plan. (Lindeyer, E.W. and Bhimarao, N. (1984). How to pay for water: both a government's and a beneficiary's concern. IWWA convention, Baroda, 23 January.)

This shortage of funds has often manifested itself through lack of fuel to run equipment (generators, diesel pumps, vehicles), **lack of materials** (chemicals, spare parts), and **lack of human resource.** It has therefore been recommended that until communities are more able and willing to meet the complete costs of investing in new water supply and sanitation services, the financing of **capital costs** should largely be the **responsibility of governments.** However, such costs should be covered only on the basis of demand from communities, as shown by their willingness to contribute to the capital costs, either in cash or in kind. Subsidies should not be used indiscriminately, but should ensure that basic services can be provided where they are requested by beneficiaries themselves and to meet the costs of promotion. **Recurrent operating and maintenance costs** on the other hand, should be **gradually assumed by the beneficiaries.**. The acceptance of such charges will be improved if funds are collected and managed by the communities rather than channelled to central governments. Recurrent cost recovery may also be more feasible if income-generating activities are linked to rural water supply and sanitation. (UNDP and World Bank (1990). Water supply and sanitation update, Vol. 1, no. 3.)

6.2 Community financing and financial management

One appropriate **approach** to increase incentives for **institutional efficiency is to decentralize responsibility for investment, operation and financing** to the levels of government below the central government, to **more autonomous public utilities** and, in some cases, to the private sector and to the community-based entities. This is a step in the right direction because it increases the likelihood that the supply institution will take more fully into account the effective demand of the users, the implications of this demand for investment choice, and the ability of the institution to meet the financial burdens it is willing

to incur. (Garn, H.A. (1989). Financing water supply and sanitation services. Collaborative Council Meeting, Sophia Antipolis, November 28 – December 1.)

In Module II it was already seen that in order to be self-sustaining, not only must the choice of technology and service levels be appropriate for the particular local conditions, but also the type of financing system. Monthly tariffs, for example, are less suitable than yearly fund raising based on careful budgeting in those communities where cash is only available once or twice a year after the harvest has been sold. Spot cash payments, on the other hand, are more suitable where small daily or weekly incomes are earned in the informal economy.

Regarding affordability, there are indications that the willingness of the users to pay for an improved system and the appropriateness of the service level are more decisive than the actual percentage of income to be spent. The tools that can predict this willingness with some measure of reliability are, however, still being developed. (Katko, Tapio (1990). op. cit; Whittington, D. (1988) Guidelines for conducting willingness-to pay studies for improved water services in developing countries.) Moreover, willingness to pay is also related to the quality of the service and the appropriateness of the payment system. High connection fees or distant payment offices have deterred lower-income users from taking a water connection, even though they were ready to pay the tariff itself. For better payments, more creativity in adapting of payment systems to the conditions and limitations of the various user groups is therefore required.

A first choice to be made in reviewing appropriate financing options is between use of general funds, collection of regular charges, spot cash payments (buying water by the container) **and down payments.** (Wijk-Sijbesma, Christine van (1987). What price water? User participation in paying for community-based water supply. Occasional Paper 10, The Hague, IRC; Katko, 1990, op. cit.) Figure 1 gives an overview of these options.

Figure 1:
Primary options for financing community-managed water supply

PRIMARY OPTIONS FOR FEE COLLECTION			
COMMUNITY FUND RAISING	REGULAR CHARGES	SPOT CASH PAYMENTS	DOWN PAYMENTS
• Voluntary funds • General community revenue • Production cooperatives • Water supply cooperatives • Revolving funds	• Annual • Seasonal • Quarterly • Monthly or bi-monthly • Weekly • Daily	• Community managed water points • Water kiosks • Institutionalized vending • Coin-operated kiosks	• Lump sum • Membership fee

SECONDARY OPTION
INDIRECT TAXATION

Source: Katko (1990)

a) **General funds**

General funds are often raised on the spot when needed, e.g. at the time when a water supply system needs repairs. **The advantage of the system** is that **no regular cash collection is needed,,** and money is only requested when there is a clear need for it. The disadvantages are that the moment **when cash is required** may come at an **inconvenient time** and that it takes some time to raise sufficient funds to buy the required spares and services. During that time, women usually have to turn to other sources, which may have serious health implications. Another disadvantage is that payment is voluntary and depends to a large extent on social knowledge as to who are large beneficiaries and who can afford to pay what.

This **disadvantage of ad-hoc fund** raising **can be minimized by estimating in advance the expected costs**, and by dividing the total by the approximate number of user families, so as to give an indication of the amount of cash to be raised per household for the year to come. This however, does require a sufficient insight into the size of the various costs in the recurrent cost budget, and skills in simple budget preparation, activities for which local water committees receive little support from water projects.

Other possible **sources of financing** are **general revenues from local levies, taxes,** etc., and income **from production or water cooperatives,** or village revolving funds. **Disadvantages** of using income from other local enterprises for financing recurrent water costs are that this **income may fluctuate or cease**, and that the enterprise itself has to meet expenses for other purposes as well. Moreover, production cooperatives usually function on the basis of shared economic interest, and the service may therefore not be extended to everyone in need of it.

An interesting variation of the creation of general revenue for water and sanitation services are the village revolving funds established in Thailand. The fund, created partly from giving out shares and partly by a government starting capital, is used to give out loans to individual households, who use them either for business purposes, or to finance improved water supply and waste disposal at the household level (rainwater collection tanks, water seal latrines). The loan is thereupon repaid with interest. Profits are paid out partly as dividends to shareholders and partly return to increase the revolving fund, until its surplus is sufficiently large to finance a basic community service, such as a library or a small water supply. Successful revolving fund villages are characterized by strong leadership, high village unity, a high level of participation, diversified sources of income, diversified services, compensation for fund managers and external inputs, including technical and organizational training and periodic review and support visits.

b) **Regular charges**

The **advantages of regular charges** are that they are **levied by every user household,** and the income is specifically for the water system and to a large extent known to the managing organization. Although regular charges are customarily charged per month, or

every three months, local management organizations can adapt frequency, timing and place of payments to suit the particular local circumstances.

Flat charges are equal for every user household. They are either **fixed by the government**, as in Guatemala, or **arrived at by dividing the estimated costs of operation**, maintenance and management by the **number of registered users**. Flat rates are easy to administer, but do not take into account differences in access, or type and amount of use. Where these are different for different categories of users, this often gives rise to conflicts and undue profits from low-cost water especially by the richer households. The latter not only use more water domestically, but also often use it for market production as well, such as animal-raising and irrigated fruit and vegetable growing, or selling water to poor families without access.

In areas with a sufficient supply of water, flat rates are sometimes replaced by weighted rates in order to charge more equally according to water use, while maintaining the low cost and easy administration of a non-metered system. In this type of system, households are classified into different categories of use, e.g. large, medium and small, according to such factors as socio-economic status, productive uses of water, single or extended family and ease of access.

> *The piped community water supply in Sibundoy, south Colombia, is one example. With the agreement of the community and the assistance of the agency's social worker, the local water committee divided the user households into four categories based on wealth and water use: low, low-to-medium, medium-to-high and high. The estimated recurrent costs of the scheme were then calculated. Taking into account the number of households in each category, the water tariffs were subsequently fixed at 23, 38, 63 and 90 pesos per month.*

Another way to finance basic water series for low-income households on a community basis is the **use of mixed systems.** Here, those families living in the wealthier parts of the community are given the possibility of a paid house connection, while free public taps are placed in the low-income sections. Operation and maintenance costs of the public taps are covered by the income from the private connections.

The possibility of metered private and group connections, to better manage water demand and charge according to actual use has already been discussed in section 2 of this module. Metering has both advantages and disadvantages, as summarized in Table 4.

Table 4:
Pros and Cons of Metering

PROS	CONS
– increase in revenue – greater equity – reduction of misuse and wastage – conservation of the resource – more accurate economic costing and pricing providing signals to increase or decrease consumption – use of a single parameter (volume) – differential tariff structures according to volume consumed – possibility to calculate meaningful lifeline rates, to predict average revenue and growth in demand – improvement of the commercial and accounting organization, management and control of a public utility – better technical control of water supply systems (subject to adequate master metering)	– cost (acquisition in foreign currency, installation, preventive maintenance, inspection, repairs) – consumers' reactions to defective meters (vandalism, non-payment) – irregular income (as opposed to flat rates) – high levels of under-registration and other technical problems (adaptation to local conditions) – logistic and other difficulties related to inspection and reading (on which billing and collection depend) – high level of accuracy required prior to computerization – billing system purely volumetric and impersonal perhaps not adapted to equity objectives – poor reliability of supply may be an obstacle to consumers' willingness to pay for metered consumption

Source: WHO (1988), op.cit.

c) **Spot cash payments**

Spot cash payments can take **the form or improved vending systems, kiosks and concession sales. Traditional vending delivers water at women's homes for cash payment or subscriptions,** but water quality is often poor and the price per liter high, and increases in times of shortage. This hampers the use of more water for better hygiene and also the health benefits associated with better water quality.In some areas users have therefore united to organize vending cooperatives. Its members pay a fixed subscription for the year-round supply of a certain amount of water to the home. As one way of improving domestic water supply, particularly in lower-income urban areas, Okun has suggested improving traditional vending by combining the use of safe water sources with more hygienic methods of water transport and delivery. (Zaroff, Barbara and Okun, Daniel (1984). Water vending in developing countries. Aqua, 5, 289-295.)

At kiosks, agency-paid staff or **private entreprenurs sell water per container to the consumers. The price per liter is usually high and consumption low,** and long distances and queuing increase real costs to women and children, and impede general and consistent use of safe water. With concession sales, private households are allowed to sell water from a metered connection at their home to their neighbourhood at a fixed profit. As shown from field cases, there are advantages in employing especially women heads of households as the

operators of such services. The critical need for paid employment combined with few opportunities to combine work with child-care, as well as social control from other women, greatly motivates these women to do a good job. Low mobility benefits service reliability and turnover rates, and regular contacts with fellow women makes it easier to include also hygiene education aspects in their work.

d) **Down payments**

Down payments are **all forms of cash** payments made as a **condition** to get a **new water system or system connection.** They can consist of lump sums deposited by communities as a reserve for maintenance and purchase of spare parts. They can also be membership or connection fees such as those charged by cooperatives.

However, down payments often cause problems. Governments cannot always meet the created expectations, with the result that considerable amounts of money remain unused and become affected by inflation. Another drawback is that down payments do not introduce the idea of permanent payments to consumers. And when required from households, poorer families, including many households headed by women, who often have the greatest health and economic need for an improved water supply, cannot afford a lump sum, although they could afford smaller regular charges for a group or house connection. Gradual payment of a connection or maintenance charge as part of the overall water tariff may in those cases be a better solution.

e) **Taxation**

A taxation system is simple to use **if all households have the same level of service,** and if generated revenue for water and sanitation is reserved exclusively for these purposes. Typically this is not the case. Because taxation is not based on actual water consumption and it is usually difficult to get enough funds from taxation actually allocated to operation and maintenance of the systems, this type of payment is only considered as a secondary option.

6.2 Women's roles in financial management and control

Whatever system communities choose to collect funds to finance improved water supply and sanitation, some kind of organization is required to manage these funds and account for their proper use to the contributors. Review of experiences with community management shows **that where women are involved in water and sanitation management, they are especially active in collecting and managing funds. They do this either directly as members of local management organizations, or indirectly, through uniting with other women** or acting through existing women's networks when water supply or sanitation causes serious problems. (Wijk-Sijbesma, Christine van (1985). op.cit.)

Experiences with community management of improved water supply and sanitation also show how important accountability and internal financial control are for proper administrative performance. Not only does good accountability reduce the risks of misappropriation of water or sanitation funds, but it also increases trust in community management capacities and gives users insight into actual costs of operation, maintenance and repairs and the financing of expansions.

In **community-managed projects**, it is therefore very **important that the responsible management,** whether a water committee or other organization, **keeps records on all income and expenditures** as well as the resulting service and coverage, and that it regularly accounts for their management to their community, group or user cooperative. Another important tool for financial control is to have the accounts checked regularly by an independent person or group in the community.

As discussed already in Module III, these findings necessitate greater planned involvement of women in local financing and financial management systems. In particular, **more women should be trained as treasurers, bookkeepers and auditors** in community-managed systems and women should be assisted in learning about the possibilities they have in improving local financial management and control. Raising awareness of the scarcity and value of water must be given the highest priority in cost-recovery approaches.

7. CONCLUSION, TRENDS, DEVELOPMENTS AND ISSUES

Development in the 1980's has taken place especially in the management of water supply and sanitation for sustained functioning. On the one hand, there is a widening of sector concerns and a recognition of **the need for a more comprehensive management of water resources and environment,** to insure that sufficient drinking water of an acceptable quality and cost remains available, and environmental pollution is kept within control.

The management of completed water supplies, on the other hand, is increasingly concentrated at lower levels, including community and neighbourhood level, especially in the case of small rural water systems and in peri-urban communities. The difference with previous management by local councils, panchayats, etc. is that now, local people and organizations are involved in the planning of these systems, are increasingly trained for management tasks, and that the roles of women in the local planning and management process are recognized and reflected in project planning and implementation.

Trends in water resource development include the limitation of water demand by using economic incentives, public education and specified water allocations; the use of innovative ways to conserve, reuse and recycle water, and dispose, treat and recycle waste; and the more comprehensive development of water sources, including rainwater harvesting, treatment of brackish water and the improvement of traditional water sources.

In these areas, **the roles of women still need more recognition.** On the one hand, **poor environmental and resource management greatly affect women's roles in water and energy supply and food production, and the economic value and consequences of these developments need wider study and publicity.** On the other hand, women's potentials in counteracting these tendencies through better domestic management, participation in public management and in environmental projects and movements should be utilized more widely. In the management of local water and sanitation systems and projects, women are increasingly involved. In rural areas they are especially involved at water point level, but their participation at higher levels (community, scheme level) should be strengthened. Also, more documentation is required on the impacts of their involvement on preventive maintenance, frequency and duration of breakdowns, hygiene and financing, areas in which women are most typically involved.

In low-income urban areas, women play a prominent role in innovative approaches to more sustainable water supply and sanitation services. They are (co)managers of communal water points (neighbourhood taps or handpumps), **latrines and vending stations, run local water supply and waste water treatment systems,** promote domestic sanitation systems and manage and **collect domestic waste for recycling and reuse.**

With the increase in completed systems, financing of recurrent costs is a growing problem. Present developments are that while most governments continue to finance the capital costs of new systems, the recurrent costs of completed systems are gradually paid by the beneficiaries on the basis of their water consumption.

This requires better adaptation of local water systems and service levels to the users' readiness to pay, planning in partnership, and the widening of finance and payment methods to various forms of community funds, household charges and vending systems, so as to allow an appropriate choice of financing in the particular local circumstances. Also, development of and training in simple budgeting and financial management and control systems is urgently required.

Some of these pilot approaches could already be applied on a larger scale, as well as transferred to other communities with comparable conditions. Others still need more thorough research and documentation, before the experiences can be used elsewhere. **Pilot and demonstration activities are further needed on the roles of women in environmental protection and control; the integrated development and management of improved and traditional water sources as holistic** water systems; the development of **local financing and financial management systems, and community management of sanitation.**

PART I: UN/DTCD **"LEGISLATIVE AND ECONOMIC APPROACHES TO WATER DEMAND MANAGEMENT"**. A strategy for the Implementation of the Mar del Plata Action Plan for the 1990s, United Nations, New York, 1991, p,1–11.

PART II: UN/DTCD **"LEGISLATIVE AND ECONOMIC APPROACHES TO WATER DEMAND MANAGEMENT"**. A strategy for the Implementation of the Mar del Plata Action Plan for the 1990s, United Nations, New York, p.40–51.

PART I

I. THE NATURE AND PURPOSE OF WATER DEMAND MANAGEMENT

Water is an indispensable factor in the well-being of peoples, regardless of culture or nation. In all the various kinds of human settlements, few activities are as universal as the striving for adequate supplies of safe water. In the words of a recent UN report:

> Abundance or scarcity of water can mean prosperity or poverty, life or death. It can even be a cause of war. Most countries have deeply worrisome problems concerning the quantity and quality of their fresh water resources, and many countries are suffering from the effects of pollution of their coastal waters. Constraints on the supply of fresh water are increasing, aggravated by droughts, depletion of aquifers, and deforestation, while demand for water is rising rapidly for irrigation, energy generation, industrial production, and urban consumption. (UN, 1990, pp. 88-89)

These issues and conflicts do not depend on any particular history, tradition, or ideology. They affect industrial and non-industrial countries, market and centrally-planned economies, arid and humid climates. The specifics of each problem may change, but the prominence of water-related issues is a constant.

Although water exists everywhere on earth, it is not always found in the quantity and quality, and at the place and time, where needed. As human activity concentrates in urban agglomerations, these problems become more acute. As a result, man has been engaged in collecting, storing, transporting, treating, distributing, and otherwise managing water for thousands of years. While some areas, especially in developed countries, enjoy the fruits of these efforts in the form of easy access to high-quality water, most of the world's population remains unserved, or under-served.

A. Demand management

Through most of human history, managing water has meant managing water supply. Water "needs", once determined, are regarded as immutable: all management efforts are devoted to locating and developing new sources, and to transporting and treating the resulting supplies. Supply expansion is typically pursued until the "need" is satisfied, or to the limits of financial affordability and/or engineering feasibility. Water management, within this limited definition, is largely a matter of financing and construction.

This report promotes a broader view. Rather than seeking a supply adequate for some set of water "needs", water management is concerned with finding an appropriate balance between the benefits of water use and the costs of water supply. "Needs" are no longer measured in cubic meters per day, but in terms of the health and welfare of human populations. Costs are not limited to cash outlays for engineering and construction, but include all adverse effects on the economy, on activities which compete for the basic resources, and on the environment.

Because of the considerable scope of water management, it is helpful to divide the subject into two categories: supply management includes the

traditional activities required to locate, develop, and exploit new sources of water in a cost-effective way, while demand management addresses the ways in which water is used and the various tools available to promote more desirable levels and patterns of use.

Distinctions between supply and demand are not always consistent throughout the literature. The precise meaning of these terms depends on the point in the water delivery system where "supply" is defined. For purposes of this report, supply will be defined at the entry point to the distribution system; after source, bulk storage, transmission, and treatment works, but before distribution piping, distribution storage, and customer taps. Actions which affect the quantity or quality of water which arrives at the distribution system entry point are part of supply management; anything which influences the use or wastage of water thereafter is demand management.

This distinction is not universal. For example, one author may describe steps taken to improve reservoir yield as water conservation which is, in turn, generally included within the rubric of demand management. Another writer may consider distribution system leakage reduction as a supply augmentation measure. Both topics are potentially valuable water management actions; the label used to describe them is less important. However, the definition implied above does roughly separate management actions into those which are oriented toward construction, engineering, and operations (supply management) and those which tend to draw on social and behavioral sciences (demand management). There are exceptions in each case, of course.

This report discusses the objectives, techniques, and results of demand management. Supply management issues--no less important to the overall development of water resources--are omitted, with a few exceptions. Since demand management may change the quantity of water which must be supplied, it is occasionally necessary to discuss the impact (on the environment, the economy, etc.) of altered supply requirements.

Demand management is described here as consisting of actions which promote more desirable levels and patterns of water use. It should be noted that most literature on the subject assumes that "more desirable levels" are synonymous with lower levels (see, for example, Rubinstein and Ortolano, 1984). While this is true in many situations, and numerous demand management measures are specifically intended to reduce water use, it need not always be true. There are situations, especially in developing countries, where the public interest may be served by increasing, rather than decreasing, water use. This is almost certainly true where price or other factors cause urban dwellers to purchase water from vendors rather than using a public system. On the other hand, the same water systems may present examples of unnecessary water waste, or of inappropriately high levels of use. Throughout this report, "more desirable levels" should be understand to permit either decreases or increases in water use, as needed.

B. Necessity for demand management

To the extent that demand management actions improve the overall management of water resources, they increase the benefit received from a given use of resources, or they reduce the resources required to achieve a certain

benefit, or both. This result, alone, may seem sufficient to argue for demand management. However, there are usually specific, and often more compelling reasons to pursue this strategy. Some common motivations for demand management are listed below.

1. Increases in water use

(a) Urban population growth

Many urban centers have experienced, and continue to experience, very high rates of population growth. This alone is capable of taxing the capacity of existing supply systems, resulting in deterioration of the quality of service and increasing the risk of supply interruption. An equally serious problem, however, is the potential that urban migration creates for high levels of future water use. Where the new migrants arrive in lower economic strata, they may be responsible for relatively little immediate increase in overall water use. As various social and economic problems are addressed, and the migrants and their families become more settled, more often provided with public services, and more prosperous, their average levels of water use can increase many-fold. This can cause a dramatic and often unanticipated increase in water demand in the future, even after high rates of immigration have ended. In all of these cases, demand management may be the best way to address the problem: in some cases it may be the only way.

(b) Industry and agriculture

Some nonresidential uses of water present issues that argue for demand management measures. This can occur in the case of industrial expansion or restructuring, where individual and sometimes unanticipated decisions by firms or government can result in abrupt increases in water use. Since significant supply augmentation often requires some years to accomplish, demand management may be the only means of coping with such changes.

Agriculture presents a different type of problem. Average levels of water use may not be capable of rapid increase, but weather-induced fluctuations from year to year can be very large. Also, because of the practical and political difficulties which usually characterize attempts to set effective prices for agricultural water, use levels and patterns may be very inefficient and ineffective. Demand management measures can be employed to improve this situation.

2. Deterioration in available supplies

(a) Discharged wastes from urban concentrations

Urban activities generate large volumes of liquid and solid wastes, which must be disposed of, either by discharge to surface water or on land. If these wastes are untreated, or inadequately treated, prior to discharge, it is likely that the quality of both surface water and ground water (due to land disposal) will become seriously degraded. At best, water supply systems which depend on these resources must increase levels of treatment and monitoring. At worst, some sources may become unusable for public supply.

Conflicts between supply contamination and water supply quality problems are not limited to developing countries. Numerous supply systems in Europe now face this problem, exacerbated by rising expectations regarding drinking water

quality (Gundermann, 1988). Serious impacts can be postponed or, in some special cases, avoided by water use reductions accomplished through demand management. The alternatives include significantly higher costs, water shortages, and/or public health concerns.

(b) Poor consumption practices

The ability of supply systems to meet the water needs of a community is diminished when water is needlessly discharged to waste, or permitted to leak from poorly maintained pipes and fittings. Also, poor usage practices may lead to contamination of the distribution system through back-siphonage. In developing countries, these problems usually arise from misuse of public standpipes. Taps may be left running when not in use, or hoses may be placed in reservoirs or ponds containing non-potable water (see, for example, Kramer, et al., 1987). In developed countries, fire hydrants may be tapped without authorization, with similar results. In all countries, poor construction practices and poor distribution system maintenance result in numerous underground leaks, which may go unrepaired for months or years.

3. Increasing costs of developing new sources

It is generally assumed that new sources of water will become progressively more costly in real (inflation-free) terms, regardless of location or country. This expectation is reasonable in nearly every case because:

(i) The least expensive sources have already been developed;

(ii) New surface water sources are more distant than existing sources, requiring additional expenditures for pumping and transmission;

(iii) Additional ground water sources will usually be at greater depth, requiring more expensive boreholes and higher pumping costs;

(iv) Population and economic expansion normally causes increased pressure on all resources, leading to higher interest rates for capital and higher opportunity costs for other inputs, including land.

4. Critical water shortages

Either the occurrence or the possibility of significant water shortage imposes costs on a community which can easily exceed the value of the water uses at risk. When people and organizations are accustomed to receiving water from a public system, the failure of that system to produce water results in inconvenience, disrupted economic activities, expenditures of labor for water-gathering, and potential sanitation problems. When shortages are expected, people are motivated to avoid activities and lifestyles which depend on constant availability of water. In either case, a substantial fraction of the benefits expected from a public water supply system can be negated by chronic unreliability, even when the actual shortfall is small. Demand management can restore reliability by reducing demand, and can minimize the costs associated with real of anticipated shortages through appropriate drought management policies.

5. Need for cost reduction in the water sector

Government budgetary crises, sometimes coupled with urgent needs in other sectors, may require a reduction in the funds allocated to water supply. Such a reduction may result from an explicit decision to reallocate funds, but it is more likely to occur slowly over time, as water supply budgets are not permitted to increase at the rate of price inflation. One consequence of fiscal reductions is a slow deterioration of service, with reduced maintenance and increased probability of system contamination or water shortage. The application of demand management can postpone or avoid these conditions, by reducing water use in a controlled, orderly way.

6. Reduced carrying capacity in water based environments

The diversion of large amounts of surface water from a lake or stream can lower water level or water flow. When water levels are lowered in any fresh water resource, associated wetlands may be severely affected, even eradicated in some cases. This effect reduces the productivity of water-related ecosystems, and diminishes the ability of these systems to assimilate wastes. To the extent that demand management reduces the need for (1) development of new sources or (2) increased withdrawals from existing sources, it can reduce, postpone, or avoid negative environmental impacts associated with water withdrawal.

7. Cumulative damage to water-based habitats

In addition to the primary impacts of withdrawal from surface water sources (drying of wetlands, etc.), continued withdrawals over long periods may promote cumulative changes in water-based habitats. These generally result from altered flow regimes, including artificially low flows during dry periods. The eventual effect is to deny suitable habitat to some indigenous species, while encouraging development of exotic or less-desirable species which may be better adapted to the changed conditions. To the extent that demand management can reduce withdrawals, such impacts can be similarly reduced, postponed, or avoided.

8. Over-exploitation of natural water supplies

In the case of large ground water aquifers with limited recharge, it is possible to sustain withdrawals much in excess of the recharge rate for long periods of time. Water levels fall, and pumping costs rise, but such a strategy often appears feasible in the absence of low-cost alternatives. The effect of such a policy, however, is to transfer water supply costs to future generations (who must solve the water supply problem after the aquifer is depleted). Proper consideration of future costs may indicate that over-exploitation of the ground water is a very poor option. Demand management can reduce the need for such withdrawals, thus reducing, postponing, or avoiding the negative consequences.

C. Objectives of demand management

Demand management is not a single tool or method, but a collection of techniques, each devised to deal with a particular aspect of water management.

The following chapters outline some of the more common purposes of demand management techniques.

1. Improved allocation of water among competing users

The way in which water is allocated among competing users, or classes of users, is of interest for several reasons. The most widely applicable of these is economic efficiency. If water is allocated to low value uses (such as irrigating low value or surplus crops) while higher value uses (new industrial activities, for example) are foregone, the total benefits obtained from a limited supply of water may fall far short of optimum. In other cases, government policy or social objectives may argue for some minimum allocation of water to certain activities, regardless of the value added by water use. Demand management, utilizing pricing and various water conservation or restriction measures, can influence the allocation of water, promoting use in sectors where increased allocation is desired, while discouraging use elsewhere.

2. Expansion of use into growth-promotion areas

In an effort to direct jobs and income to regions with the greatest needs or opportunities, governments often designate specific areas as economic growth areas. Inducing new activities to locate in these areas, however, involves a number of actions by government, including the provision of positive economic incentives. Water demand management can play a direct role in such efforts through pricing policies with make water available at reasonable cost. Demand management has an indirect role, as well, through practices which improve the reliability and control the overall cost of water supply.

3. Increase in water sector revenues

Through careful analysis of water use, adoption of appropriate tariff structures, and control of costs, demand management increases the net revenue (or decreases the net loss) derived from the water supply sector. This result is especially beneficial in countries where the water sector is constrained by lack of funds, or where surpluses from water supply can be put to good use in other public programs.

4. Postponement of new construction

To the extent that demand management results in lower current or projected water use, construction of new supply facilities can be postponed. This reduces the cost of supply, but it can have other important effects. In non-industrial countries with unfavorable balances of trade, construction delays also conserve scarce foreign exchange otherwise needed for imported equipment. Adverse environmental consequences of certain water supply projects (principally impoundments and diversions of surface water, as well as exploitation of shallow ground water) are also postponed.

5. Drought management

In even the most carefully planned and constructed water supply systems, water shortages are still possible. Temporary reductions in water supply may be due to meteorological drought, source contamination, or facility failures of various kinds. These events, including drought, occur everywhere, in developed

and developing countries, in high rainfall and low rainfall climates. It has been said that drought affects more people than any other natural hazard (Wilhite, 1990).

Because demand management can be used to produce lower water use levels, it can reduce the vulnerability of a water supply system to meteorological drought. Another aspect of demand management--drought management planning--can minimize the disruption and cost associated with water shortage. An orderly program of voluntary and mandatory reductions in water use can allocate progressively more water to most important uses, while maintaining the integrity of the distribution system (protecting it from de-pressurization and resultant contamination).

6. Reduction in unnecessary use and wastage

Some demand management measures--including metering, pricing, leak detection, hydrant and standpipe monitoring, distribution system maintenance--are undertaken with the sole purpose of minimizing the wastage or unnecessary use of water. Allowing leaks to persist, or allowing taps to run to waste, increases supply cost for all customers with little or no offsetting benefit. For many customers with building connections, the mere presence of a meter and a metered use-based tariff causes water use to decline significantly, as unnecessary or wasteful uses are eliminated.

7. Conservation of the resource

Conservation can be defined in at least two ways. If the only concern is for the water resource, conservation requires reductions in water use and water losses. These reductions can be accomplished through demand management. A more broadly applicable definition, however, considers conservation of all scarce resources, including water (Baumann, et al., 1984). In this case, water use reductions must be beneficial: they should not conserve water at the expense of other resources. The primary tool for carrying out such a policy is, as before, demand analysis.

8. Water quality control

Water use has implications for water quality in at least three ways.

(i) Withdrawal of quantities of water from natural systems may affect the quality of the remaining water (as well as that withdrawn). Changes in levels and flow regimes of surface water alter habitats and induce changes in biological communities. Withdrawal of groundwater in the vicinity of brackish or contaminated aquifers may cause mixing and subsequent contamination of the water supply aquifer.

(ii) Increasing use of water requires exploitation of additional sources. Where the availability of safe sources is limited, additional supply may include waters of poor quality and doubtful safety.

(iii) As more households, firms, farms, and other activities use more water, more wastewater is produced. The wastewater must be discharged to surface water bodies, sometimes with inadequate treatment or no treatment at all, promoting the deterioration of these resources.

Since all three types of water quality deterioration become worse with increasing water use, they can all be improved by using demand management to reduce water use.

9. Sustainable development

For existing or planned economic development to be viable, it must be in proper balance with the resources on which it depends. This is particularly evident in the case of the water resource. Water supply systems must:

(i) Protect and enhance water related environmental amenities;

(ii) Ensure due consideration for and protection of existing water-based economies (fishing, recreational activities, etc.);

(iii) Be developed so as to maintain safe thresholds of economic viability.

Full attention to these criteria requires comprehensive water management, including both supply and demand elements. Supply measures should respect the characteristics and alternative uses of sources, while demand measures insure that only the necessary amounts of water are used.

D. Criteria for ranking priorities

As demonstrated above, there is no single objective for demand management. Instead, there are a number of different and potentially conflicting purposes, each of which has a claim for the attention of the water manager. In practice, therefore, there must be some ranking of issues and of alternative solutions, so that decisions reflect the best compromises and highest priorities.

1. Objective criteria

Of the various possible evaluation criteria, there are some which utilize observable data, so that objective rankings can be obtained. Selected examples of objective criteria follow.

(a) National economic situation: regional and sectoral growth rates

Where water management is expected to impact the growth of the regional economy, or to affect sector development, policies can be evaluated on the basis of projections of key indicators, such as gross domestic output, employment growth, personal income, etc. Demand management proposals can be compared on the basis of their effect on these indicators.

(b) Population growth rates

Population growth rate, often viewed by water planners as a given, can also be seen as an indicator of performance. Where population growth is constrained, directly or indirectly, by water management policies (because of water-related living conditions or limited employment opportunities due to lack of water for industrial expansion) and where increased population growth is desired as a matter of public policy, demand management programs can be evaluated on the basis of their ability to increase population. In other

situations, increased urban population may be undesirable, since it decreases agricultural output and creates many social and economic problems in cities. Here demand management may be designed to discourage further growth, and can be evaluated accordingly.

(c) Areas served/unserved with water supply

In many cities in developing countries, large urban populations are unserved or inadequately served by public water supplies, with resulting social, economic, and public health problems. Demand management policies can be evaluated in terms of their ability to expand coverage, whether measured as population served, households served, or area served. It may also be necessary to distinguish between users served by building connections and those served by public standpipes. There may be alternative levels of standpipe service, depending on average spacing, or maximum distance to dwelling units.

(d) Costs of developing new supplies

An important motivation for demand management in many situations in the need to reduce the cost of planned new supplies. This is accomplished by reducing demand so that needed facilities can be deferred and/or reduced in size. The degree of cost reduction, net of the cost of implementing the demand management program, provides a useful criterion for measuring the effectiveness of any proposed demand management program.

(e) Worsening or newly recognized water quality problems

As noted above, water supply systems can be associated with adverse impacts on source water quality or on the quality of water bodies receiving return flows. Various objective measures of water quality may be used to describe these effects, including dissolved oxygen, biochemical oxygen demand, temperature, total dissolved solids, and pathogen indicators. When demand management practices are undertaken for the purpose of reducing these impacts, the water quality measures are used as evaluation criteria.

2. Public policy/political will

To be successful, demand management programs should be consistent with public policy and politically feasible. Since many demand management measures reallocate water and cost responsibility (as compared to the prior situation), their will be those who gain from the program and those who lose. Political decision-makers must be sure that the benefits enjoyed by many are perceived to be large enough to justify the adverse effects on the few. Programs which satisfy these criteria are much more likely to be implemented.

3. Social pressures/user demand

Some demand management programs are devised in response to public pressure for changes in water management practices. This may reflect discontent over proposed supply expansion projects, reaction to rising water costs, or dissatisfaction regarding existing allocation of water. The degree to which a demand management plan addresses and satisfies the concerns of the public and of water users is an indication of its likely success.

4. Environmental and sustainability requirements

Water demand management programs may also be judged on the degree to which they meet environmental objectives, or satisfy sustainability requirements. Numerous individual criteria can be defined within these subject areas, including some which may be represented by objective indicators. The most desirable programs, however, are those which consider environmental and sustainability issues in a comprehensive way, producing improvements over a range of indicators, rather than focusing on a few narrow issues.

E. Sustainable sector development and resource conservation

Further issues arise where water sector plans must be developed against a background of national economic and social goals, combined with a need for sustainable development incorporating full consideration of resource conservation. These considerations arise most strongly in demand management, due to impacts on expectations of and controls over future water use.

1. Urban water use

Future water supply needs in urban areas are often regarded as fixed, and other public policies are adjusted accordingly. Where sustainable development or conservation issues dictate, future water use can be constrained, either in total or in terms of per capita use. Demand management measures are then adopted which insure that actual water use does not exceed the planned limit. Planned water sources, supply facilities, etc., can be sized accordingly, saving investment as well as resource use.

2. Agricultural water use

Supply constraints on agricultural water use need not lead to shortages and economic disruption. Demand management measures may include more efficient irrigation practices, altered cropping patterns, and alternative land uses, so that water use targets are met at minimum social cost. In this way, the resource can be conserved without excessive impacts on other scarce resources, and adverse environmental effects of return flows are reduced.

3. Industrial water use

Projections of future industrial water use should consider not only product type, production quantities, and employment, but may also reflect changes in water use practices. These include recycling, elimination of unnecessary water use, and more water-efficient processes. The result is conservation of the resource, and reduced hydraulic loading on industrial waste treatment facilities and on receiving waters.

4. *In situ* water uses

Sustainable development requires an appropriate balance among all surface water uses, including such *in situ* uses as maintenance of biological communities, flow regulation for downstream uses, and water quality maintenance. These uses compete with withdrawal uses for the available water in the stream. When urban, industrial, and agricultural uses are excessive,

in-stream uses suffer. Conversely, when demand management is used to insure that withdrawal uses are no larger than necessary, more water is available for in-stream uses.

5. Return flow impacts

Nearly all water uses are associated with return flows. These range from the wastewater collecting in an urban sewer system to the irrigation return flow percolating into ground water tables, then discharging in a nearby stream channel. Where demand management is used to constrain future levels of water use, and to influence the allocation of water among uses, returns are similarly reduced and/or reallocated. In some cases (urban wastewater), the quantity of pollutants delivered is not changed to any significant degree, although in other cases (crop irrigation), leached minerals may be reduced by lower flows. Since the rate of return flow is a function of water use, demand management strategies intended to modify water use also modify return flows.

PART II

IV. ECONOMIC TOOLS FOR DEMAND MANAGEMENT: OTHER INCENTIVES

Water use responds to many kinds of economic incentives, including the tariff provisions described in the previous chapter. This chapter discusses additional economic incentives which can be implemented outside of the structure of a tariff. Some of these measures are more narrowly focused and more flexible than tariff provisions. Others are more broadly applicable.

A. Economic tools for management of domestic demand

1. Difference between metropolitan areas and small communities

Patterns of domestic water use, and the applicability of various demand management tools, vary widely from one community to another. Small communities tend to have homogeneous use patterns. Since most water users behave in similar ways, demand management targets can often be met using only one or a few measures. However, unit supply costs are higher for small systems, making demand management an attractive alternative in some situations. But small systems also have few technical or analytical resources, limiting their ability to identify and implement appropriate management tools.

Large metropolitan areas, on the other hand, demonstrate considerable diversity in levels and patterns of domestic water use. This is particularly true in developing countries with substantial rural-urban migration. Recent arrivees, especially those living in squatter communities, may not have access to building connections. Depending on the distance from residence to public standpipe, per capita water use may range from 2 to 70 liters per day (Postel. 1984). In the same city, others may live in modern housing equipped with a full range of water using appliances, drawing as much as 350 liters per day per person. Suburban dwellers with detached housing units and lawns and gardens can account for as much as 1,000 liters per day per person.

Demand management tools applicable to large urban areas range from measures intended to encourage increased water use in low income areas, to severe disincentives for low value uses in high income areas. Nearly every kind of management measure can be considered for possible application, and aggressive demand management programs may require simultaneous implementation of a number of programs. Water agencies serving metropolitan areas are more likely to be aware of management possibilities, and to have the ability to evaluate and implement various measures. Nevertheless, most water agencies of all sizes fall well short of effective management of demand.

2. Incentive payments for water use modification

Domestic users of water will sometimes agree to modify use levels or patterns in return for a cash payment. If enough users participate in such a program the water system, in turn, may be able to postpone or avoid construction of new facilities. In order to qualify for an incentive payment, water use modifications should be continuing and verifiable. A continuing modification is a commitment on the part of the user to sustain the changed pattern of water use for the foreseeable future. This may involve the installation of equipment, or the permanent adoption of new water use habits.

A verifiable modification is one that can be observed and monitored by the water agency, using readily available information.

Many kinds of incentive payments can be devised, provided the above conditions are met. Three examples are described below.

(a) Voluntary quotas

A household may voluntarily accept a limit on the amount of water that can be used in any billing period. The limit is set for each participating user at a level below prior use and, once set, is fixed thereafter. It may be in effect for each billing period, or only during certain peak months. The household receives an incentive payment, usually on a periodic basis (each year or each billing period), so long as the quota is not exceeded. If the quota is exceeded, the incentive payment is not made and a penalty may be applied.

With sufficient participation, voluntary quotas can be effective in reducing the level of water use year-round, or during the peak season. Funds for the payments are obtained by increasing the water tariff paid by all customers. This increase is in lieu of the increase that would otherwise be sought if capacity were expanded.

(b) Flow restrictors

A flow restrictor can be placed in a household service line, limiting the maximum rate at which water can be withdrawn. The restrictor may be in the form of a pressure reducing valve, a constant-flow valve, or a simple orifice. A household which accepts the installation of such a device may be rewarded by a periodic incentive payment, so long as the device remains installed. (Occasional inspection may be necessary.) Penalties for removal are possible, but not generally needed.

If the restriction is sufficiently severe (maximum flows on the order of 3 liters per minute may be required), and if a significant number of households participate in the program, the result may be a noticeable reduction in peak demand on the distribution system. This, in turn, may permit the agency to defer or avoid investment in distribution and storage facilities. As in the case of voluntary quotas, the incentive payments are financed by other users, who are spared the expense of new construction.

(c) Landscape subsidies

Where residential lawn and garden irrigation is commonplace, it may be possible to reduce the quantity of water required for this purpose through landscape design. This can be done by limiting the amount of turfgrass (through use of low water use groundcover, gravel borders, etc.) and using drought-resistant shrubs and grasses. Incentive payments can be provided for specific landscape features. In semi-arid environments, for example, payment may be made for properties without humid climate trees or shrubs (those using "desert" vegetation). Payments may be made on a square meter basis for gravel plots. Incentives may be provided to owners of high water use properties to assist them in re-landscaping with drought-resistant species.

In all of these examples, the payments may be periodic but are more often implemented as a single, one-time payment. In this way, a single inspection of

the property is sufficient to qualify the household for a payment. The result, given sufficient participation, is a reduction in water use during peak irrigation seasons (hot, dry weather).

3. Discounts for purchase of low water-using appliances

Chapter II describes various plumbing fixtures and water-using appliances that have been designed for low water use. The purchase and installation of this equipment can be mandated or left to voluntary action by individual households. In the latter case, the rate of adoption can be increased by providing economic incentives beyond those implied by the tariff. These incentives take the form of either discounts or rebates on the purchase of fixtures and appliances. In the first case, payments may be made direct to retailers to compensate them for discount pricing practices. Under the second strategy a rebate is paid directly to the purchaser on presentation of satisfactory proof of purchase (proof of installation may also be required).

Increased adoption rates for these devices result in lower average levels of domestic water use, permitting the water agency to defer or avoid capacity expansion. The incentive payments are financed by increasing the tariff level for all customers, who would otherwise have to pay the cost of new facilities. Incentive payments must necessarily be made to all who install the equipment, including those who would have done so in the absence of the payment.

B. Economic tools for demand management in agriculture

Agricultural water use is particularly difficult to manage by means of the economic incentives provided by tariffs. Two reasons are:

(1) Agricultural water use is seldom priced on a volumetric basis (actual usage is either not measured or not used as a basis for charges); and

(2) agricultural tariffs in many countries incorporate large subsidies.

Economic incentives that can be provided outside of the tariff structure, then, are of particular interest.

1. Production projections

Most agricultural irrigation uses methods similar to those first developed 5,000 years ago: flooding fields, or channeling water through narrow furrows. Water flows by gravity across a gently sloping field, seeping into the soil along the way. Most of these systems fail to distribute the water evenly, and use an excessive amount of water. By some estimates, as little as half of the water applied to the field actually benefits the crops (Postel, 1985). Once water has been allocated to a farm there is usually no reason, either economic or operational, to use less.

Assuming that the irrigation system has some ability to measure the quantity of water delivered to a particular farm, it is possible to use production projections to create an economic incentive for careful use. Water requirements are projected for the next growing season, taking into account acreage, cropping patterns, and existing irrigation practices. In the case of flood or furrow irrigation, it is assumed that the fields are properly leveled

and graded, so that unnecessary waste is avoided. The projections are conservative, in that they assume efficient use of water. Each farmer is entitled to receive the projected quantity of water at the usual cost. Any use in excess of the projected quantity causes a large penalty charge to be imposed. This produces irrigators with a clear incentive to use no more than the minimum necessary quantity of water.

Another approach is to prohibit any use of water in excess of the projected amount. The State of Arizona (U.S.) uses this method, calculating the minimum amount of water needed to grow the planned crops (the "water duty"). Irrigators may not exceed the calculated water duty, but may carry over unused amounts from year to year (Emel & Yitayew, 1987).

2. Incentives for purchase of low water-using irrigation systems

Flood and furrow irrigation systems involve little capital investment, and have low operating costs. They require large amounts of water, however, because of uneven distribution and high evaporation rates. Improved systems are available, requiring pumping, pipe systems, and various kinds of devices to deliver the water to the plants. All of these involve capital investment and additional operating costs; all reduce the required amount of water. The most capital-intensive system--drip irrigation--requires the least water. Incentives for investing in improved irrigation systems are often small or entirely absent, depending on the tariff and the amount of subsidy it incorporates.

One way to promote adoption of more efficient irrigation systems is to create a tariff that includes a volumetric price and recovers the full cost of supply, as described in Chapter III. In the absence of such a tariff, it is possible to provide incentives for purchase of improved systems using either discounts or rebates. The government can offer the equipment to farmers at a discounted price. Alternatively, farmers who do buy and install the equipment may receive a cash payment, or rebate, to partially compensate them for the cost. Incentives can also be provided through the tax system, by offering accelerated depreciation or tax credits to those who have installed the equipment. Any of these methods should increase the number of farms which adopt more efficient practices, reducing the water required for irrigation.

Another economic strategy for stimulating adoption of low water-using irrigation systems is to make the availability of low-interest loans contingent on the purchase and installation of improved irrigation equipment. Conditions attached to such a loan could include minimum standards of quality for manufacture and installation of such equipment (Chandrakanth & Roma, 1990).

3. Penalties or surcharges for polluting the supply

Return flows from agricultural water use introduce contaminants into receiving waters in a number of ways. Where water is used for stock watering and uses other than irrigation, return flows may carry animal wastes into nearby streams. This problem is probably best addressed through improvements in drainage, waste flow detention, or treatment. It is generally not responsive to water management strategies.

A quite different water quality problem arises from the discharge of irrigation return flows into surface water, or percolation into ground water.

As a result of flushing, mineral leaching, and evaporation, irrigation return flows often have high total dissolved solids as well as pesticide and fertilizer residues. Wherever return flow volumes are significant compared to dry weather streamflow, or where significant amounts reach ground water, water quality problems are likely to ensue. While these problems are usually associated with increased salinity and nutrient levels, or pesticide residues, toxic minerals sometimes appear. Severe impacts on wildlife due to irrigation-derived selenium appearing in surface water have been reported in the western U.S. (National Resource Council, 1989).

Irrigation return flows are controlled in various ways. Any measure which affects irrigation water use, including those discussed above, affects the quantity and therefore the quality of return flow. Lower water use without change of technology reduces the volume of return flow, while increasing the concentration of dissolved solids. Improved water use technology can reduce evaporation and minimize the wetted soil area, leading to lower solids concentrations and reduced leaching. But whether lower water use, by itself, improves water quality depends entirely on circumstances.

Just as measures which affect irrigation water use also influence pollution from return flows, measures devised to control return flows influence water use. Where return flows can be observed (point source discharges to surface water), penalties or surcharges can be applied to either quantities discharged, or to various measures of pollutant load including maximum concentrations. Analysis of the total impact of such measures is complex. Incentives to reduce the quantity of water discharged lead to reduced water use and to more efficient irrigation methods. An incentive to reduce the maximum concentration of pollutants in the return flow creates a further incentive for increased water use and less effective irrigation methods, provided irrigation technology is not changed. If the response to this restriction is a change in technology, substantially lower water use may result.

4. Incentives for use of lower-quality water

Many opportunities exist for utilizing low quality water, principally recycled wastewater, for irrigation. Even vegetable crops can be irrigated in this way, if sufficient wastewater treatment is provided. A decade-long study in Monterey County, California, demonstrated the feasibility of using effluent from an advanced wastewater treatment facility--at one-fifty the cost of a new freshwater source (Postel, 1989).

Where treated wastewater is available in the vicinity of irrigated agriculture, tariffs can be devised which reflect the incremental cost (the cost of transmission plus additional treatment, if needed). In some cases this price will be below existing agricultural water (depending on the size of the subsidy); in most cases it will be below the cost of agricultural water from new sources.

5. Introduction of low water-using crops

Irrigated crops associated with relatively high water use per hectare include rice, sugarcane, maize, vegetables, mulberry, and fodder of various kinds. Depending on the climate, there may be alternative crops which can produce comparable economic benefits with lower water use (e.g., groundnuts, sunflower, sorghum, ragi). Dissemination of information concerning these

crops, combined with the existence of an appropriate tariff for irrigation water use, will often lead to changes in cropping patterns, and reductions in overall water use. In some cases, it may be necessary to demonstrate successful cultivation and to develop markets for the new crops.

Additional economic incentives may be used to promote alternative crops, including differential pricing for water or, in the case of groundwater irrigation, differential pricing for pumping energy (Chandrakanth & Romm, 1990). Thes strategies are appropriate where the usual prices for water or electricity include a significant subsidy.

6. Incentives for changes in land-use patterns

Another way to control the use of water for irrigation is to influence the allocation of land to irrigated agriculture. Land which is marginally productive, or which is located some distance from the main irrigation works, might fail to produce net income which justifies the use of water. Subsidized irrigation tariffs promote inefficiencies of this kind, yet it is often difficult to remove the subsidy.

Marginal land can sometimes be removed from production by offering the owner a payment, contingent on the land remaining fallow for the coming growing season. The U.S. has long made use of such payments (called "set-aside" payments) to manage agricultural output. So long as the payment does not exceed the total subsidy that would have applied to water used on the land, then the result will contribute to overall efficiency.

Instead of payments for non-production, subsidies can be granted to development for alternative use. Payments can be made for maintenance of acceptable wildlife habitat, or for conversion to public use of some other type. Tax policy can also be used to create incentives to abandon agriculture on marginal or remote cropland.

C. Economic tools for demand management in industry

Industrial water use includes water needed for manufacturing processes and water used in thermal-electric power plants. Considered as a whole, industrial water use is the second largest sector world-wide, after agriculture. Within the industrial sector, the largest single use is for cooling water in nuclear and fossil fuel-fired power plants. Unlike agriculture, where a large fraction of water used is consumed (evaporated or transpired into plants), much of the water used in industry is discharged as wastewater, sometimes after a single pass through a cooling process ("once-through" cooling).

Due to pollution control laws and industrial re-structuring, industrial water use in developed countries is generally static or declining. In the developing world, however, where industrial water use in often less than 10 percent of total withdrawals, attempts to expand industrialization may lead to rapid increases. This is particularly true if new manufacturing firms in those countries, operating under severe capital constraints, choose low cost but water-intensive technologies. Industrial water use in Latin America, for example, is projected to increase by 350 percent between 1975 and 2000 (Postel, 1984).

1. Tax rebates on recycling or waste treatment equipment

The experience of developed countries has been that constraints on water use, or economic incentives for lower water use, lead to greatly increased recycling ratios within industry. Instead of using water once, it may be used two or three or ten times in some manufacturing processes. The installation of cooling towers allows cooling water to be reused perhaps twenty-five times before being discharged.

Also, requirements for more complete waste treatment have often led to increased recycling, as firms realize that the treated wastewater is suitable for many processes. The firm has as strong incentive to use the wastewater, rather than pay for additional water input (purchased from a public system or withdrawn, treated, and pumped from a private supply).

Adoption of recycling and improved wastewater treatment facilities can be directly promoted, using tax policy to create economic incentives. This can be done by liberalizing deductions: the firm may be permitted to depreciate the capital cost of recycling or treatment facilities over a very short period. It can also be accomplished through tax credits: on proof of investment in the proper facilities, the firm is allowed to reduce its taxes by an amount set by the government. In both cases, the result is an increased incentive to invest in, and use, water saving processes and practices.

2. High use surcharges

Firms can also be encouraged to reduce water use by levying a surcharge on all water used in excess of some chosen base amount. If the base amount is set equal to the water requirements of the industrial process, provided all water saving processes and methods are in use, then the firm will pay a penalty only if it fails to adopt all possible water-saving practices. The level of the surcharge determines the amount of water savings to be expected, as the firm make investments in order to avoid paying the extra charge.

3. Penalties and fines for polluting industries

As noted above, any fines or penalties levied on industrial discharges of water-borne pollutants create an incentive to reduce water use. If penalties apply to the volume of wastewater discharge, then the firm will be motivated to increase recycle ratio, thereby reducing the final volume. If the quantity of pollutants is the issue, penalties will promote the construction of improved wastewater treatment works. These new facilities will produce higher quality effluent which will, in turn, be more attractive for internal recycling, rather than discharge.

modified to isolate all costs associated with water supply, and then to categorize those costs by function (as described above). This change will begin the development of an improved financial data base, suitable for later use in demand management evaluation

(d) Customer metering. Ultimately, effective management requires that each customer be provided with a properly maintained meter. Several criteria can be used to determine the sequence of installing (or rehabilitating) customer meters. Considerations of revenue enhancement and political acceptability may dictate installation according to decreasing customer size. Industrial and large commercial customers would be metered first, followed by other commercial, institutional, and large residential customers. Small users and low-income areas would be metered last. On the other hand, development of a data base suitable for demand management planning requires that at least some meters be installed within all customer groups, so that sectoral water demand can be estimated. A compromise strategy would install a broad, cross-sectional sample of meters first, then proceed to complete metering in the sequence noted above. All meters would be read, but none would be used for billing until that customer class was fully metered.

(e) Billing and collection. As customer metering progresses, attention must be given to the billing and collection system. As described above, bill must be rendered accurately and promptly and payment must be enforced. Specific procedures and policies are needed to insure these results.

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1. How would you apply new approaches in water resource development in your country?

2. What economic tools would you apply for water demand management?

3. How would you include women in water resource development planning, paying particular attention to the financial and management control?

NAME OF PARTICIPANT

.....

INSTITUTION

.....

OCCUPATION

.....

COUNTRY

.....

DATE

.....

Mark the box which corresponds best to your opinion on each question.

1. Your professional interest in the particular topic included in this modular unit was:

   high ☐ ☐ ☐ ☐ low

2. The objectives of this module were:

   clear ☐ ☐ ☐ ☐ not clear

3. Would you say that the objectives of this module met all, some or none of your expectations?

   3.a) Which objectives were not met?

3.b) Explain briefly why the objectives were not met.

4. The contents of this module were:

well structured ☐ ☐ ☐ ☐ badly structured

4.a) If they were badly structured, explain why.

5. The terminology in this module was:

easy to understand ☐ ☐ ☐ ☐ hard to understand

6. The visual material (slides, drawings, diagrams...) used in this module was:

clear ☐ ☐ ☐ ☐ confused

useful ☐ ☐ ☐ ☐ useless

7. The checklists have covered the subject studied:

completely ☐ ☐ ☐ ☐ not at all

8. The checklists were:

useful	☐	☐	☐	☐	useless
too simple	☐	☐	☐	☐	too complicated
sufficient	☐	☐	☐	☐	insufficient

9. Studying this module enabled you to learn:

many new things	☐	☐	☐	☐	nothing new

10. The knowledge acquired through this module will, in your present profession be:

useful	☐	☐	☐	☐	useless

11. The knowledge acquired through this module will, in the near future be:
(Reply to this question only if the answer to question no. 10 is negative)

useful	☐	☐	☐	☐	useless

12. List the topics you would like to have treated more extensively:

1) .....

2) .....

3) .....

13. List the topics you would like to have treated to a lesser extent:

1) .....

2) .....

3) .....

14. List the topics not included in this module which you think are of particular interest to your profession:

    1) .....

    2) .....

    3) .....

15. List any suggestions for improvement of this training module:

    .....

    .....

    .....

    .....

    .....

    .....

This evaluation questionnaire should be sent to:

UN/INSTRAW,
P.O. BOX 21747
SANTO DOMINGO
The Dominican Republic

TRAINER'S GUIDE

HARDWARE

1. Overhead projector
2. Screen
3. Slide projector, 24 mm with synchroniser
4. Blackboard
5. Flipcharts (optional)
6. Tape recorder

DOCUMENTS TO BE USED BY THE TRAINER

See "Module Structure", page 3

DOCUMENTS TO BE DISTRIBUTED TO TRAINEES

WIV-1.1: Target groups

WIV-1.2: Objectives

WIV-2.1: Table of contents

WIV-2.2: Text

WIV-2.3: Additional reading

WIV-2.4: Bibliography

WIV-3.1: Checklists on key issues for group work

WIV-3.2: Evaluation questionnaire

KEY POINTS	TRAINING METHOD AND ACTIVITIES	DOCUMENTS TO BE DISTRIBUTED	AUDIOVISUAL SUPPORT MATERIAL
INTRODUCTION			
1. Objectives	Presentation		
2. Purpose and objectives of water resources development	Presentation/discussion		WIV-1 WIV-2
PRESENTATION			
3. Interdisciplinary nature of water resources planning	Presentation		WIV-3
4. Current and future threats to the system	Presentation/discussion		WIV-4 WIV-5 WIV-6
5. Preservation of water resources/ domestic WSS services	Presentation/discussion		WIV-7
6. Nature and purpose of water demand management	Presentation		WIV-8 WIV-9
7. Objectives and approaches to demand management	Presentation		WIV-10 WIV-11 WIV-12 WIV-13
8. Role of women in WSS management	Presentation/discussion		WIV-14 WIV-15
9. Women, water resources and environmental protection	Presentation/discussion		WIV-16
10. Economic tools for demand management	Presentation/discussion		WIV-17
11. Sustainability and local financing	Presentation		WIV-18 WIV-19
12. Women's roles in financial management and control	Presentation/discussion		WIV-20
13. Future trends, developments and issues	Presentation/discussion		
SUMMARY			
14. Key issues checklists	Group discussion	Checklists WIV-3.1	
15. Presentation on checklists	Plenary discussion		
MONITORING AND CONTROL			
16. Module evaluation questionnaire	Individual activity	Questionnaire WIV-3.2	

NAME OF TRAINER .....

COUNTRY ..... DATE .....

AVERAGE EDUCATIONAL QUALIFICATIONS OF PARTICIPANTS .....

.....

.....

.....NUMBER OF PARTICIPANTS .....

Mark the box which corresponds best to your opinion on each question.

1. To what extent has the module achieved the objectives stated?

☐ over 80%

☐ 70 – 80%

☐ 60 – 70%

☐ 50 – 60%

☐ less than 50%

2. Did the objectives meet the needs of the group?

totally ☐ ☐ ☐ ☐ *not at all*

3. On the basis of the objectives stated, the subject matter is:

relevant ☐ ☐ ☐ ☐ irrelevant

4. The progression of the subject matter is:
(Give reasons for your answers)

too fast ☐ ☐ ☐ ☐ too slow

5. List the topics you would like to have treated in the package more extensively:

   a) .....

   b) .....

   c) .....

6. List the topics would like to have treated to a lesser extent:

   a) .....

   b) .....

   c) .....

7. List the topics not included in this module that you think should be included:

   a) .....

   b) .....

   c) .....

8. The technical quality of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

9. The relevance of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

10. The quantity of the audiovisual material was:

    high ☐ ☐ ☐ ☐ low

11. The sound/slide package (where applicable) was:

    too long ☐ ☐ ☐ ☐ too short

12. Your global evaluation, bearing the objectives and teaching resources of the module you have tested in mind is:
(Give reasons for your answer)

excellent ☐ ☐ ☐ ☐ mediocre

After completion, please forward this document to:

UN/INSTRAW,
P.O. BOX 21747
SANTO DOMINGO
The Dominican Republic

WIV-1: Water availability on earth

WIV-2: Purposes and objectives of water resources development

WIV-3: Purposes and functions of water resources projects

WIV-4: The water resource as a system

WIV-5: Current threats to the system

WIV-6: Threats to water resources

WIV-7: Future threats to the system

WIV-8: Sustaining water and sanitation services

WIV-9: Scope of water management

WIV-10: Necessity for demand management

WIV-11: Objectives of demand management

WIV-12: Approaches to demand management

WIV-13: Sustainable water supply in low-income urban areas

WIV-14: Management of water quality

WIV-15: Involvement of women in water management

A. Low-income urban areas
B. Rural areas

WIV-16: Strengthening community management

WIV-17: Women, water resources and environmental protection

WIV-18: Economic tools for demand management

WIV-19: Trends in cost financing

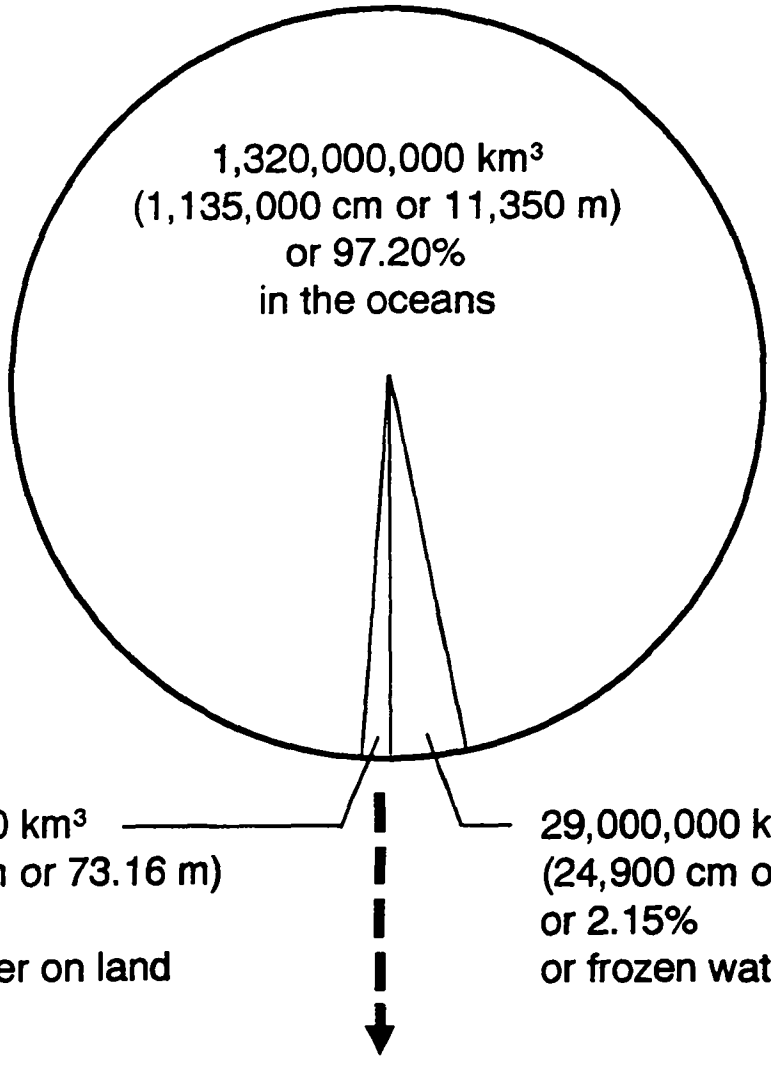
WIV-20: Options for community financing systems

WIV-21: Roles of women in financing and control

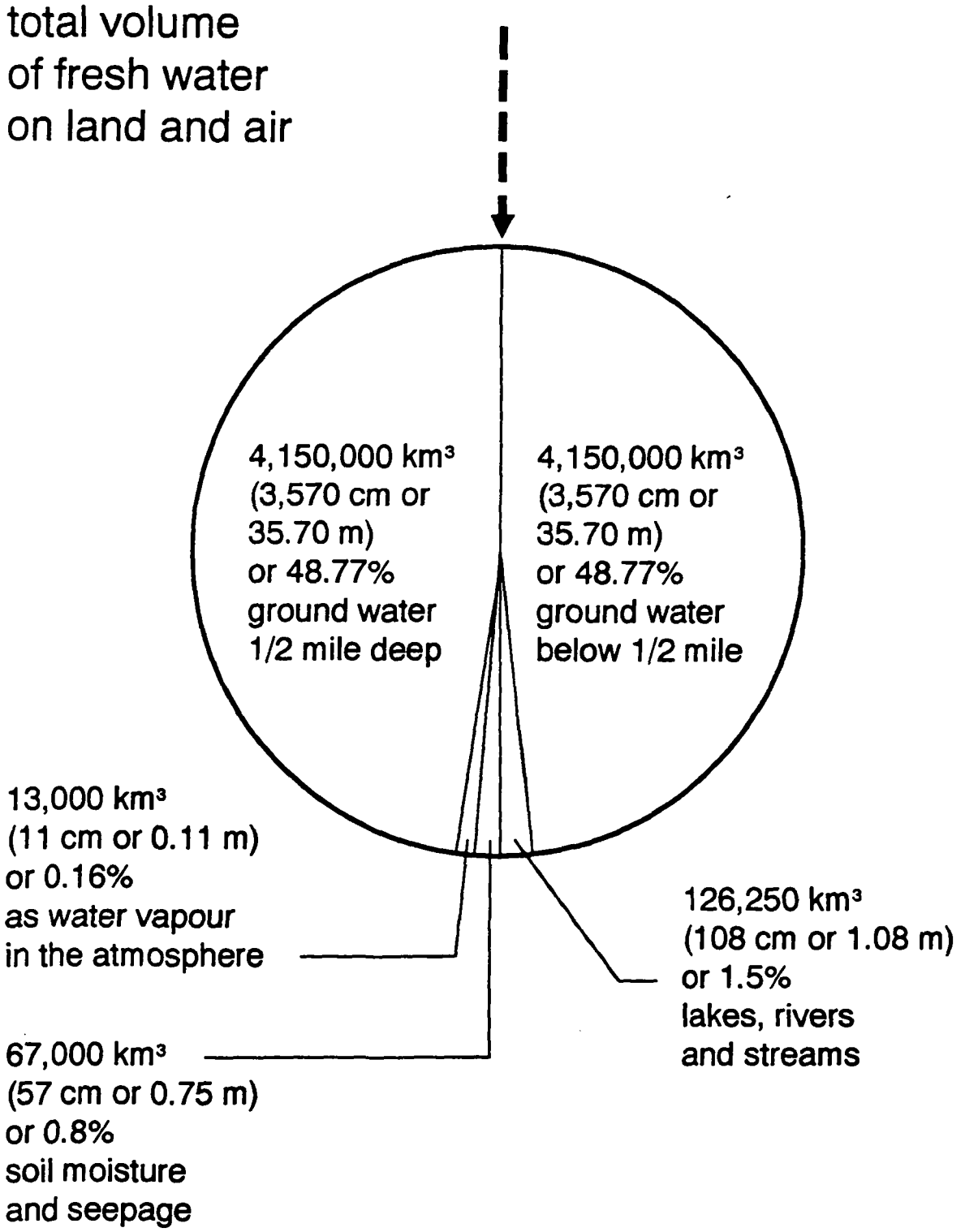
TRANSPARENCIES

Water Availability on Earth

1,357,506,000 km³
(1,167,200 cm or 11,672 m)
total volume
of water



Source: Doxiadis, 1967, in Water Encyclopedia, 1990



PURPOSES AND OBJECTIVES OF WATER RESOURCES DEVELOPMENT

- MEET A DEMAND FOR WATER
- SOLVE A PROBLEM CAUSED BY WATER
- TAKE AN ADVANTAGE OR AN OPPORTUNITY (DAM SITE FOR HYDROELECTRICAL POWER DEVELOPMENT)

PURPOSES AND FUNCTIONS OF WATER RESOURCES PROJECTS

- WATER SUPPLY FOR RURAL, MUNICIPAL, INDUSTRIAL USES
- WATER SUPPLY FOR THERMAL-ELECTRIC POWER PLANT
- IRRIGATION, INCLUDING WATER SUPPLY
- FLOOD CONTROL AND DAMAGE PREVENTION
- HYDROELECTRIC POWER
- NAVIGATION
- WATER QUALITY MANAGEMENT
- RECREATION
- COMMERCIAL FISHING AND TRAPPING
- DRAINAGE, SEDIMENTATION CONTROL, LAND STABILIZATION, EROSION CONTROL

THE WATER RESOURCES AS A SYSTEM

- SOCIAL AND ENVIRONMENTAL IMPACTS
- INSTITUTIONAL AND LEGAL ASPECTS
- PHYSICAL THREATS TO WATER RESOURCES SYSTEM
- SUSTAINABILITY OF WATER RESOURCES DEVELOPMENTS

CURRENT THREATS TO THE SYSTEM

- ACID RAIN
- DESTRUCTION OF FORESTS
- URBANIZATION
- DESTRUCTION OR POLLUTION OF COASTAL ECOSYSTEMS

THREATS TO WATER RESOURCES

LANDSCAPE DESSICATION FROM:

- DEFORESTATION OF WATERSHEDS
- OVEREXPLOITATION OF GROUND WATER

WATER STRESS FROM:

- INCREASED AND COMPETING WATER USES
- DIMINISHING WATER RESOURCES

WATER POLLUTION FROM:

- LACK OF PROPER EXCRETA DISPOSAL, WASTE WATER AND SOLID WASTE DISPOSAL, TREATMENT AND REUSE
- HIGH SOIL EROSION

FUTURE THREATS TO THE SYSTEM

- CLIMATIC CHANGE
- GREENHOUSE WARMING
- SEA-LEVEL RISE
- WATER SUPPLIES
- AGRICULTURAL POLICY
- STRATOSPHERIC OZONE DEPLETION
- ENVIRONMENTAL QUALITY

SUSTAINING WATER AND SANITATION SERVICES

TRENDS AND DEVELOPMENTS:

- SMALL, COMMUNITY-MANAGED WATER SYSTEMS IN RURAL AREAS
- MORE FLEXIBLE RANGE OF WATER SERVICES IN LOW-INCOME URBAN AREAS
- CREATION OF DEMAND FOR LATRINES
- LOCAL PRODUCTION AND MARKETING OF LATRINES, THROUGH:
  - PRIVATE SECTOR
  - VILLAGE HEALTH WORKERS
  - COOPERATIVES

SCOPE OF WATER MANAGEMENT

- **SUPPLY MANAGEMENT – TRADITIONAL ACTIVITIES TO LOCATE, DEVELOP AND EXPLOIT NEW SOURCES OF WATER IN A COST-EFFECTIVE WAY**

- **DEMAND MANAGEMENT – WAYS IN WHICH WATER IS USED AND THE VARIOUS TOOLS AVAILABLE TO PROMOTE DESIRABLE LEVELS AND PATTERNS OF USE**

NECESSITY FOR DEMAND MANAGEMENT

- INCREASES IN WATER USE
- DETERIORATION IN AVAILABLE SUPPLIES
- INCREASING COSTS OF DEVELOPING NEW SOURCES
- CRITICAL WATER SHORTAGE
- NEED FOR COST REDUCTION
- REDUCED CARRYING CAPACITY
- CUMULATIVE DAMAGE
- OVER-EXPLOITATION OF NATURAL WATER SUPPLIES

OBJECTIVES OF DEMAND MANAGEMENT

DEMAND MANAGEMENT IS A COLLECTION OF TECHNIQUES:

- IMPROVED ALLOCATION OF WATER AMONG COMPETING USERS
- EXPANSION OF USE INTO GROWTH-PROMOTION AREAS
- INCREASE IN WATER SECTOR REVENUES
- DROUGHT MANAGEMENT
- REDUCTION IN UNNECESSARY USE AND WASTAGE
- CONSERVATION OF THE RESOURCES
- WATER QUALITY CONTROL
- SUSTAINABLE DEVELOPMENT

APPROACHES TO DEMAND MANAGEMENT

REVERSE TRENDS IN WATER CONSUMPTION:

- METERING CONSUMPTION
- PROGRESSIVE CHARGING
- PUBLIC EDUCATION
- ALLOCATION OF WATER QUOTA

CONSERVE, REUSE AND RECYCLE WATER

DEVELOP NEW WATER RESOURCES:

- RAINWATER HARVESTING
- BRACKISH WATER
- TREATED WASTE WATER

SUSTAINABLE WATER SUPPLY IN LOW-INCOME URBAN AREAS

WIDER RANGE OF OPTIONS, INCLUDING:

- AGENCY-MANAGED SERVICE STATIONS
- COMMUNITY-MANAGED SERVICE STATIONS
- COMMUNITY-MANAGED NEIGHBOURHOOD TAPS
- PRIVATE GROUP CONNECTIONS
- COMMUNITY-MANAGED NEIGHBOURHOOD NETWORKS
- COMMUNITY-MANAGED AUTONOMOUS SYSTEMS

MANAGEMENT OF WATER QUALITY

- ENVIRONMENTAL IMPACT ASSESSMENT IN PROJECT PREPARATION
- ECONOMIC INCENTIVES TO REDUCE POLLUTION
- POLLUTION CONTROL STANDARDS
- INVOLVEMENT OF COMMUNITY:
  - PROTECTION OF LOCAL WATER SOURCES
  - ENVIRONMENTAL HYGIENE AT WATER POINTS
  - IMPROVEMENT OF COMMUNITY SANITATION

INVOLVEMENT OF WOMEN IN WATER AND SANITATION MANAGEMENT

A. LOW-INCOME URBAN AREAS:

- MANAGERS OF COMMUNAL WATER POINTS/TOILETS
- MANAGERS OF WATER VENDING STATIONS
- ORGANIZERS/MANAGERS OF AUTONOMOUS WATER SYSTEMS
- PROMOTERS OF HOUSEHOLD LATRINES
- MANAGERS AND COLLECTORS OF RECYCLEABLE WASTE

B. RURAL AREAS:

- MANAGERS OF COMMUNAL WATER POINTS
- MEMBERS OF WATER/SANITATION MANAGEMENT ORGANIZATIONS
- MEMBERS OF WOMEN'S WATER COMMITTEES AND GROUPS

STRENGTHENING COMMUNITY MANAGEMENT

- BUILDING ON TRADITIONAL MANAGEMENT SYSTEMS
- INVOLVING WOMEN AS A GROUP IN PLANNING MANAGEMENT SET-UP
- AVOIDANCE OF FULL MANAGEMENT BURDEN ON WOMEN
- MORE DOCUMENTATION ON MANAGERIAL PERFORMANCE
- DEVELOPMENT OF MANAGEMENT CAPACITIES THROUGHOUT PROJECT CYCLE

WOMEN, WATER RESOURCES AND ENVIRONMENTAL PROTECTION

A. AT COUNTRY LEVEL:

- PREPARE COUNTRY PROGRAMMES AND REVIEWS
- FORMULATE NATIONAL CONSERVATION STRATEGIES
- ANALYSE POSITION OF WOMEN IN ENVIRONMENTAL MANAGEMENT

B. AT PROJECT LEVEL:

- ASSESSING IMPACTS ON WOMEN'S ENVIRONMENTAL INTERESTS
- ENHANCEMENT OF BENEFITS OF ENVIRONMENTAL PROJECTS FOR WOMEN
- ASSISTANCE TO WOMEN AS ENVIRONMENTAL MANAGERS
- SAFEGUARDING AND USE OF WOMEN'S ENVIRONMENTAL KNOWLEDGE

ECONOMIC TOOLS FOR DEMAND MANAGEMENT

- **WATER TARIFF (SINGLE, TWO PART, MULTI-PART)**
- **TOOLS FOR DOMESTIC DEMAND**
- **AGRICULTURE**
- **INDUSTRY**

TRENDS IN COST FINANCING

FINANCING OF CAPITAL COSTS BY GOVERNMENTS

FINANCING OF RECURRENT O & M COSTS BY BENEFICIARIES

OPTIONS FOR COMMUNITY FINANCING SYSTEMS

A. COMMUNITY FUND RAISING:

- VOLUNTARY FUNDS
- GENERAL COMMUNITY REVENUE
- PRODUCTION COOPERATIVES
- WATER SUPPLY COOPERATIVES
- VILLAGE REVOLVING FUND

B. REGULAR CHARGES

- FLAT
- WEIGHTED
- MIXED
- METERED

C. SPOT CASH PAYMENTS

- COMMITTEE-MANAGED TAPS
- KIOSKS
- INSTITUTIONALIZED VENDING

ROLES OF WOMEN IN LOCAL FINANCING AND CONTROL

- PLANNING OF LOCAL FINANCING SYSTEM
- BUDGETING
- FUND COLLECTION
- FUND MANAGEMENT
- FINANCIAL RECORD KEEPING
- AUDITING OF BOOKS
- ACCOUNTABILITY FOR SYSTEM MANAGEMENT

MODULE V

EVALUATION AND MONITORING OF WATER SUPPLY AND SANITATION PROGRAMMES, PROJECTS AND THE ROLE OF WOMEN

The present training modules on **"Women, Water Supply and Sanitation"** comprise an up-dated revision of the modules originally prepared in 1986 by the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) and the ILO Training Centre, in Turin, Italy.

This version, has been undertaken as a collaborative effort by INSTRAW, the ILO Training Centre in Turin, Italy, and the United Nations Department of Technical Co-operation for Development (UN/DTCD), through its Task Force on Women's Development. The production of the training packages was funded by UN/DTCD.

The DTCD Task Force, established in 1982, is the oldest such entity in the United Nations system, and comprises collective expertise and experience in all substantive sectors within the Department's mandate: natural resources and energy; development planning; statistics; public administration; population; and social development. The prime objective of the Task Force is to promote the integration of women in all aspects of development. The issuance of the up-dated modules is an initiative towards that end.

The training package was **up-dated** by **IRC**-International Water and Sanitation Centre, The Hague, The Netherlands. It was **reviewed** by **Ms Dunja PASTIZZI-FERENCIC**, Director, Natural Resources and Energy Division (UN/DTCD), **Mr. Kenneth EDWARDS**, Chief Water Resources Branch (UN/DTCD), **Ms Margaret HOWARD**, Programme Officer and **Ms Marcia BREWSTER**, Programme Officer, Water Resources Branch (UN/DTCD). The training package was **completed** and **finalized** by **Ms Borjana BULAJICH**, Social Affairs Officer, UN/INSTRAW.

The audiovisual support material was prepared by **Ms Adelina GUASTAVI**, Programme Manager, **ILO Training Centre**, with the support of the Media Production of the ILO Training Centre in Turin, Italy. The training package was completed under the guidance of **Mr. Giulio PIVA**, Chief Training Operations, **ILO TRAINING CENTRE.**

The team would particularly like to express their appreciation to **Ms Lilian Moro** for her patience in the word-processing of this training material, and to **Ms Denise Zoccola** for the final desktop publishing layout.

The modules are conceived as a package containing all the information, examples, exercises, audiovisual and control aids necessary for:

- the **trainer** to deliver a lesson or conduct training activities;

and/or

- the **trainee** to analyse, reinforce and apply the theoretical concepts learned during training sessions;

and/or

- the **professional** as self-learning reference material to upgrade knowledge and skills related to effective integration of women in WSS sustainable projects and programmes.

In order to reduce the learning time and improve the learning efficiency, keeping high the motivation of the user, the text of the module contains only that information and activities considered essential for the achievement of the training objectives as specified in the following pages. Additional reading material is included for those users who wish to study in greater depth specific subjects related to the subject considered in this module.

From a pedagogical point of view, the structure of the modular package consists of five components – as specified on the following page – which are easily adaptable to the needs of both the trainer and the trainee.

1. *INPUT DOCUMENT*

1.1 Target groups

1.2 Objectives

2. *BODY OF THE MODULE*

2.1 Table of contents

2.2 Text

2.3 Recommended additional reading

2.4 Bibliography

3. *OUTPUT DOCUMENTS*

3.1 Checklists on key issues for group work

3.2 Evaluation questionnaire

4. *TRAINER'S GUIDE*

4.1 List of training material

4.2 Lesson plan

4.3 Trainer's guide evaluation form

5. *VISUAL SUPPORT MATERIAL*

5.1 List of audiovisual support material

5.2 Transparencies

5.3 Sound/slide package "The Involvement of Women in Evaluation and Monitoring of WSSP"

The trainer will make use of the five components indicated above, while the trainee will only be provided with the material related to components 1, 2 and 3.1.

- Senior officials of Ministries of Education, Health, Planning, Public Affairs, Social Welfare, etc.
- Development planners and provincial or local authorities in charge of water supply and sanitation projects and programmes.
- Engineers in charge of designing and implementing water supply and sanitation projects..
- Representatives of non-governmental organizations, including women's organizations, which are active in water supply and sanitation projects and programmes.
- Trainers and managers of national training institutes training staff on drinking water and sanitation technologies, health education, community development and women's programmes.

GENERAL OBJECTIVES

To enable the users to identify the basic concepts, methodologies, practices and techniques used in evaluation and monitoring of WSS projects and programmes and the role of women.

SPECIFIC OBJECTIVES

On completion of this unit, the users will be able to:

1. identify areas for improvement of evaluation methodologies on women and development.

2. recognize the functions and characteristics of external and participatory evaluations and monitoring;

3. formulate evaluation topics and questions regarding women's roles in WSS projects and the impacts of these projects on women;

4. identify community-based education and monitoring and the role of women therein for overall programme management.

Page

1. *INTRODUCTION*

In the **1960s**, the conceptual development of **evaluation** was very much **donor oriented.** Thus, evaluation was mainly **limited** to identification of beneficiaries and to **cost-benefit analysis** with a **bias towards cost.** This is what **today** is referred to as **appraisal.** At the same time, **conventional project** design **did not involve beneficiaries** in project design, there was **inflexibility in execution, lack of monitoring and evaluation,** transfer of western ways to non-western cultures, stressing **achievement** of **short-term efficiency and administrative** and bureaucratic **top-heaviness** and project did not set in motion a self-sustained process and therefore failed.

By the **1980s,** interest had expanded to **include the benefit side.** This brought a number of **issues** to the fore, such as: **what to measure, how to collect information** at reasonable cost and in a timely manner, who should do it. In turn, this led to the **question of how-to-build gender-sensitive evaluation** into project design since by and large women's issues have not been built into programme/project design. In most cases the **purpose of evaluation** has to be broadened to look at **effects on women** even if they are not part of the objectives. The purposes of the evaluation exercises are very relevant for answering the question of who should perform evaluations. Quite often evaluation exercises were perceived as threatening by project personnel. Generally speaking, external experts had more credibility, but in the case of WID project/programmes the external evaluators were frequently not familiar with the interdisciplinary and cross-culture approaches adopted in those programmes/projects. Evaluation by donors is particularly important for WID purposes since it might generate more resources for generally insufficiently funded womens' specific programmes/projects.

2. *EVALUATION METHODOLOGIES FOR PROGRAMMES AND PROJECTS ON WOMEN IN DEVELOPMENT*

In November 1989, INSTRAW organized the consultative meeting on "Evaluation Methodologies for Programmes and Projects on WID". The objective of the meeting was to discuss the elaboration and up-grading of guidelines and methodologies of the United Nations organizations for the evaluation of programmes and projects – both mainstream and women – specific- with a view to promoting the integration of women in all aspects and phases of mainstream programmes and projects and to enhance the development effects of women's projects. (INSTRAW, **Consultative Meeting on Evaluation Methodologies for Programmes and Projects on Women in Development**, Report by the Director of the Institute, INSTRAW/BT/1990/CRP.I/21. Dec. 1989.)

It is generally **difficult** for programme developers **to define criteria** for programme or **project success particularly** in relation to innovative and catalytical programmes and **projects related to WID.** The impact evaluation should be performed by using both quantitative and qualitative data, including data on social change which are most relevant

for WID project and programmes. The effect of environmental changes on women needs to be included in evaluation methodologies, particularly defining the interrelationship between population growth, natural resources, environment and development. In this connection, there is a need to include data on women on long-term projections and modelling and develop adequate methods of achieving such projection.

One of the **crucial components of evaluation methodologies** are the principles of **economic analysis of projects and programmes.** For example, cost-benefit analysis of rural development projects could lead to project improvement so as to secure movements of yields obtained by women farmers. However there is a difficulty in applying cost-benefit analysis with precision as there is a number of WID programmes and projects that were evaluated as too costly in terms of narrowly conceived cost-benefit analysis without taking into account wider socio-economic objectives and developmental change advocated by WID approaches.

2.1 Areas for improvement of evaluation methodologies for programmes and projects on WID

Following areas are recommended to be further expanded for more effective evaluation methodologies. (INSTRAW, Ibid., pp 34–38):

1. Effect/impact analysis

In order to expand and further disseminate the knowledge base, to provide inputs to the further development of training programmes, guidelines and checklists and to improve future programmes and project design, **efforts** should be made **to assess and document the effects and impact of projects.**

In view of the time and cost constraints of rigorous impact analysis, a selective approach should be taken to permit the concentration of resources and effort. The selection of individual cases on studies should reflect the need to demonstrate, document and explain better both successes and failures and intended and unintended effects and impacts of WID specific and mainstream programmes and projects.

Maximum use should be made of United Nations organizations' current capacities, knowledge and on-going and programmed activities.

2. Data bases

Most **data base on WID are not user-friendly** to be easily utilized by planners and programmers and most existing country profiles, at macro and national level have limited usefulness to programme/project design. Therefore, the bases for general backstopping for WID programmes should be prepared on a user-friendly basis and a mention of existing country profiles that have **data on women or are WID-specific should be developed** and made available to international and national users. Country profiles at the sectorial and

regional levels that also profile WID and income groups should be developed, as well as appropriate networks for sharing them.

The United Nations organizations should promote the production of disaggregated information at the country level and should, through institutional development, support individual government's capacities to produce such disaggregated data.

3. Cost effectiveness of data collection

Considering the funding constraints to, particularly impact evaluations, the achievement of **greater cost-effectiveness beginning with data collection is crucial.** Therefore, the **maximum use** should be made of **national consultants,** local **experts and project participants themselves,** who could act as **data collection agents.** The **greater exchange of data** among organizations in the **United Nations' system** and with **bilateral technical cooperation agencies** should be sought as well the constant updating of available data.

4. Types of expertise and evaluation

WID awareness as well as familiarity with the relevant issues had proved to be important determinants of the extent and quality of WID consideration in evaluations. Therefore, all missions or **formulation appraisal,** monitoring and evaluation should **include expertise on WID.** WID rosters of experts should be developed with sectorial categorization and identification of local experts by region and country and also technical and evaluation rosters that identify individuals with WID capabilities and evaluation expertise. Evaluation should be done by both internal and external evaluation teams throughout the project cycle, that is design, monitoring of implementation and final evaluation.

5. Human/cultural factors in evaluation

It is generally felt that in addition to a **general lack of evaluation methodologies** that take into account the WID dimension, there is **also lack of consideration of the human factor** in general in currently applied evaluation methodologies. Inasmuch **as the situations cannot be "culture-free" and "gender-neutral", methodologies** developed to evaluate women-specific projects and programmes could **bring to mainstream development methodologies** an insight on **how to improve evaluation** so that it could be more applicable to all forms of developmental assistance.

- In developing evaluation research strategies, the influence of factors such as **culture, gender, age, ethnicity and class** in shaping programme/project implementation effects and impact **should be taken into account;**
- **Gender-specific or gender neutral policies** should be applied according to **different purposes of evaluation processes.** Gender-specific methodologies could be used for mainstream projects and programmes in order to promote equality;
- WID approaches should be utilized to motivate and disseminate up-to-date thinking – for example in considering the effects of structural adjustment processes, the fight against the feminization of poverty, the significance of women's work in the informal

sector, the interrelationships of socio-economic aspects with the environment – and thus to contribute to the evolution of development paradigms.

6. Feedback and follow-up

In view of the observation that the relevance of evaluation for the improvement of programmes and projects and for further refinement of **evaluation methods was often lost because of inadequate follow-up** to and analysis of evaluation exercises, it is recommended that:

- in order to **assure follow-up evaluation,** missions be required to include in the evaluation report a plan of action for implementation of all the recommendations made, which should include the identification of local agencies and capacities;
- **current evaluation exercises be analysed** and evaluated selectively with the purpose of drawing lessons for the improvement of existing and development of new evaluation frameworks.

7. Training

It is generally acknowledged that the human resources factor is ultimately the most important determinant of progress in the integration of women in development, and it is, at present, insufficiently developed in this field. It is **recommended** that:

- **United Nations organizations increase their efforts to brief and train their staff, consultants and experts on how to apply the WID dimension** in project design, implementation and evaluation;
- **United Nations organizations make an effort to include training in WID** in their programmes for **project personnel**, for example by making the availability of women's course in the curriculum one of the criteria for selection of the training institutions to which candidates are assigned;
- When **fielding evaluation** or project formulated missions, organizations **use the opportunity for in-house training** of field staff and selected government officials.

8. Participatory evaluation

The **participatory approach** is considered particularly important for ongoing, project management oriented evaluation because it leads to (a) **generation of relevant in-depth community-level information,** (b) **advocacy and awareness of WID,** (c) **greater acceptability** and support of the programme/project by women, (d) **improvement of policy design,** and (e) **evaluation of the assumptions** that informed initial **design**, and (e) evaluation of the assumptions that informed initial design even if at the time of formulation these were not apparent.

The resource demands of participatory evaluation were, at the same time, recognized as exceeding the resources of organizations. It is recommended that:

- a limited number of project be deliberately selected to test the validity of the approach, with explicit inclusion of WID.

9. Purposes of evaluation

Given the importance attached to advocacy and awareness raising and the innovative nature of most WID projects and project components, it is suggested that **evaluation** exercises **should**:

- continue to be viewed as one **means to raising awareness** of the importance on **including women's participation** and needs in mainstream development **programmes/projects;** and
- at the same time be **used as an efficient management tool to foster interdisciplinary and innovative WID approaches.**

10. Institutional constraints

It was identified as constraints for long-term policy design on WID the **changing priorities of different donors, particularly in selecting priority countries, and the insufficient involvement of national Governments** and institutions in evaluation processes. It was recommended that:

- the organizations of the **United Nations system make particular efforts to strengthen national and local capability for evaluation purposes** and that to this end they **make greater use of national and community-based** educational and technical **institutions;**
- these institutions should incorporate female research staff.

11. Sustainability

It was recognized that for the development programmes/projects to produce the desired long-term WID effects it is necessary to **build** into them **elements of government commitment and capacity,** it was recommended that:

- **sustainability** should be a **priority of development co-operation organizations,** except in the case of pilot programmes/projects;
- utmost **importance** should be **given** to programme/project designs which ensure **long-lived activities;**
- there be **increased co-operation with partners at the national level** to secure continuity to efforts;
- **funding** for mainstreaming **WID approaches be increased;** and
- **United Nations organizations explore the possibilities** of establishing independent **trust funds at the national level,** and of building coalitions among institutions **dealing with WID at the national level.**

12. Community-based approach

It is **crucial for monitoring and evaluation to follow an integrated community-based approach,** since **most WID projects/programmes** should be **participatory** and should be adapted to the **needs and cultures of the given community** without losing sight of the changes to be introduced. Relevance of developing those **interactions** with **mainstream organizations** and the institutions of a given country is a **prerequisite** to increase community commitment to the projects **that could result** in project strengthening.

The community-based approach requires **continuous monitoring as an in-built element of the programme/project,** and monitoring should start from the basis of needs assessment which should start from the identification of the extent to which present notions on women's role determined a need to secure attitudinal or behavioural changes. The country-based approach should **not only evaluate the outcome of the project/programme** (e.g. houses built, number of trained persons, etc.) but should **also provide information on the programme/project impact.** In other words, it should evaluate the programme/project effectiveness over a longer period of time.

The community-based self-reliant approach for evaluating the WID dimension in programmes/projects may also prove **valuable in solving other problems related to the linkages of micro-level implementation and macro-level national policies and international strategies;** for example, **who defines context, determines objectives** and their translation into a plan of operation, who **defines the organizational framework** and **sets the criteria to measure institutional performances** and to what extent success criteria are capable of pointing to unintended consequences as well as desired results. It can also permit monitoring and measuring the long-term effectiveness of outputs, even beyond the lifetime of the activity that generated them. **Application** of the **self-reliant approach** requires, however, **training on at least four levels: members of the target group,** suitable group promoters/organizers, members of the **implementation/management team** and the **extension workers,** especially women in all three groups.

3. *MONITORING AND EVALUATION OF WATER SUPPLY AND SANITATION PROJECTS.*

One characteristic of good project management is that information is collected on how well projects are carried out, what results are achieved and where improvement are still needed. This is done through both monitoring and evaluations. **Evaluations involve the assessment of the achievements of a project and of the activities, methods and financial inputs by which these achievements have been reached.** Evaluations are both a way to account for investments made, and a managerial tool to identify ways to develop and improve an ongoing project, or to improve the preparation of a new project. (Boot, Marieke (1987). Training course Evaluating water supply and sanitation projects. Course Modules. (Training Series No. 2). The Hague, IRC and UNICEF). With regard to women's involve-

ment, evaluations are useful for checking upon the commonly made assumptions that: women participants benefit from water and sanitation projects; and the project benefits from women's participation.

Evaluations are carried out at specific points of time in the project cycle, e.g. at **the end of a pilot stage, at mid-term, at the administrative end of the project,** and some time after the project has become operational. In large-scale programmes, where implementation is an ongoing process, community projects will be at different stages of implementation and operation, so that evaluations in the first groups of communities can be used to improve subsequent community projects.

Monitoring, on the other hand, **is an ongoing activity.** It consists of the scheduled **collection of** – often standardized – **information on implementation and functioning from the lowest levels** (water point, neighbourhood, community) upwards. This information is compiled and combined at the next (division, district, regional) levels, until the overall summary data reach the top. Monitoring **enables** the project management **to follow the progress of the project,** assess users' reactions and see if outputs materialize according to expectation. (Casley, Dennis and Lury, Denis (1982). Monitoring and evaluation of agriculture and rural development projects. Baltimore, John Hopkins University Press.) It allows to **keep track of trends and new developments** and compare between regions or districts. It also makes it possible to **collect factual data as inputs for periodic evaluations.** An example is the records on the number and functioning of completed water points, and the frequency, duration and causes of non-functioning.

3.1 The changing character of evaluations

Conventional large-scale water and sewerage projects **depend** on detailed **blueprint plans** for implementation. These plans provide the basis for control and predictability. The primary management task is to use the blueprints to achieve construction goals effectively and efficiently. **Evaluations** are usually **conducted by external experts,** midway and at the end of projects, to assess achievements of production goals, quality and quantity of construction completed, and costs. The major aim is to assess whether the funds are well-spent and to determine if funding should continue. (Narayan-Parker, Deepa (1990). Participation evaluation: Tools for managing change in water and sanitation. New York, PROWWESS/ UNDP.)

Present developments go more and more towards **evaluation as a learning process. Periodically,** and not just midway or at the end of a programme, internal **evaluations are carried out by project agencies through their own field staff** to assess whether the installed facilities and the processes by which they are installed lead to the right results. Community members, e.g. the local water committee, hygiene promoters or user group, participate increasingly and more actively in such evaluations.

Differences between the two types of evaluations are set out in Table 1.

Table 1
Differences between conventional and participatory evaluations

Who	External experts.	Community, project staff, facilitator.
What	Predetermined criteria of success, principally costs and production output.	Room for people to identify their own indicators of success, which may include production outputs.
How	Focus on scientific objectivity; distancing of evaluators from other participants; uniform through complex procedures; delayed limited access to results.	Self-evaluation, simple methods adapted to local culture; open immediate sharing of results; local involvement in evaluation processes.
When	Usually upon completion; sometimes also mid-term.	Merging of monitoring and evaluation; hence regular small evaluations.
Why	Accountability, usually summative, to determine if funding continues.	To empower local people to initiate, control and take corrective action.

Source: Narayan-Parker, 1990.

3.2. Purposes and focus of participatory evaluations

Participatory evaluations have several purposes. For the communities, they **allow the assessment of results** under the given forms of technology, community participation and involvement of women. They make it possible to **identify what problems still exist and what the community itself can do** to solve or rectify these problems. For example, it may be found that not all households in the community have a latrine. It may also be found that those without a latrine are especially those without family help: widows, single women with small children, old couples. To solve this problem, the community may decide that they will help these households obtain a latrine by organizing the necessary voluntary labour and local materials and executing all work these households cannot do themselves.

For agencies, the purposes are the same as for the communities: assessment of implementation processes and results, identification of remaining problems and determination of what the agency must do to enable the communities to solve these problems. In addition, evaluations have for the agencies the wider and longer-term goals of improving planning, implementation and training for projects in other communities and of sharing

findings both nationally and internationally, e.g. through articles in engineering and development journals, presentations at meetings and conferences, etc. (Table 2.)

Table 2
Purposes of participatory evaluations

Purpose	Community	Agency
Evaluation	Assessment of project processes and results.	Assessment of project processes and results.
Improvement	Deciding what problems still exist and what the community will do to solve them.	Deciding what problems still exist and what the agency will do to help the community solve them.
Revision		Adaptation of project planning, implementation and training in the light of lessons learned.
Diffusion		Informing others on experiences to enhance knowledge and reduce or prevent project failure.

An early example of an internal evaluation comes from a water supply project in Southern Guinea Bissau.

Every six months the local water promoters, who work in teams of men and women to reach both sexes equally well, evaluated the continued functioning and use of handpump wells in the villages of their working areas. The evaluation lasted one to two days. The promoters observed conditions and consulted both men and women. They then wrote down their findings in the local language. This report was presented to a meeting with the village development committee, the male and female pump caretakers and the health educators. Results were checked and discussed and decisions taken on what actions the community and agency would take, so as to solve existing problems in the community concerned. Programme-wise, identifying problems on non-utilisation in the first evaluations led also to more general improvements. The agency changed its procedures for involving men and women in pump-siting and at the same time intensified hygiene education. As a result, continued use of unsafe sources for drinking decreased from a range of 25–56 per cent to a range of 13 to zero per cent. (Ploeg, Jan Douwe van der; Wijk, Christine van (1980). Community participation in the rural well construction programme of Guinea Bissau. Agua, 9/10, 21–23.)

Besides a **change in purposes and approach, the focus of evaluations** is also undergoing a change. Previously, evaluations mainly assessed the costs, output and quality of construction of improved facilities. Where poverty alleviation was an additional goal, they also assessed whether the low-income target groups were being reached.

While output, cost and groups reached continue to be important, present evaluations also focus on the longer-term effects of the projects. **These include evaluating:**

- adequate functioning of completed facilities;
- effective utilization;
- processes by which functioning and use are achieved;
- resulting benefits to populations and economies;
- sustainability of functioning, use and benefits;
- replicability of developed approaches.

4. EVALUATING FUNCTIONING AND USE: THE MINIMUM EVALUATION PROCEDURES (MEP)

4.1 Scope and purposes of the MEP

The ultimate objective of allocating resources for water supply and sanitation investments are to improve the health, welfare and economic status of the users of the facilities constructed. These objectives cannot be fully achieved unless the facilities are functioning in the correct way and are consistently utilised by the whole community. Thus, the **MEP is designed to evaluate functioning and utilisation and concludes with a discussions of impact study methodology and findings from documented impact studies.** (WHO (1983). Minimum Evaluation Procedure (MEP). Report No. ETS/83-1, CCD/OPR/83.1. Geneva, World Health Organization.)

MEP evaluations may focus on one or more of the three stages of functioning, utilisation and impact. Deficiencies found in the evaluation of a particular stage or in the inputs to the stage under review will also affect negatively the results of the next stages. There is, therefore, little value in evaluating a particular stage unless the objectives of the previous stage have been largely achieved. Evaluation of impact is only appropriate for a project known to be correctly functioning and well utilised.

An example is a rural water supply project which, when working, frees women and children from long trips for early water collection, increases water consumption for domestic and personal hygiene, enables the children to attend school in time, and allows the women to better manage the day's workload and participate in various kind of development activities. However, evaluation of these benefits is useless when a large number of water points is out of order for considerable periods, or does not supply enough water for all users. Similarly, evaluating impacts of latrine projects makes little sense when many are not working or maintained properly, or not actually used.

To evaluate functioning of improved water supplies and latrines, the WHO advocates checking four key items for water supply and three for sanitation, and to identify possible underlying reasons for the types of problems found.

For water supplies the items for evaluation are:

- **a sufficient water quantity** throughout the year, taking into account also seasonal variations in source, supply and demand, and population growth;
- **an acceptable water quality** throughout the year;
- **a reliable supply** with low frequencies and duration of breakdowns throughout the year;
- **good accessibility** of water points: all or almost all households live within a maximum distance from an improved water point, which preferably is closer than risky traditional sources used for domestic purposes.

For latrine projects, evaluation criteria include:

- a high and **growing proportion of households** with an **installed and completed** latrine;
- **good quality design and construction,** which facilitates maintenance and hygienic use;
- **latrines working properly.**

More details on how actually to measure functioning and use can be found in the MEP document.

Once the possibility of using improved water supply and sanitation, (i.e. completed and working facilities) has been established, both scope and manner of actual utilization can be assessed. To evaluate use, several items have been recommended (WHO (1983). op.cit.; GTZ (1989). Indicators for success. Community participation and hygiene education in water supply and sanitation, how to measure progress and results? Frankfurt, German Agency for Technical Cooperation; Parker (1990).

- **General use:** all or almost all households actually use improved water points and latrines;

- **Consistent use:** they do so throughout the year, without reverting to other sources or practices with a health risk (diarrhoeal diseases, schistosomiasis, guinea worms, hookworm);
- **Exclusive use:** other water sources or sanitation practices constituting a health risk are not used alongside improved ones;
- **Hygienic use**: water points, sources and latrines are kept clean, and domestic water is collected, stored and drawn in a safe way (no contamination from touching by possibly soiled hands);
- **Increased use**: higher volumes of water are used for domestic and personal hygiene;
- **Controlled use:** use of water resources and latrines without negative impacts on water availability and environment, such as over-exploitation of groundwater, deforestation, overgrazing, chemical and bacteriological contamination, etc.

4.2 Making minimum evaluations gender-specific

In evaluating functioning and use in water supply and sanitation projects, Hannan-Andersson points out the importance of doing so in a gender-specific way, linking questions on performance and use to the differences in needs, practices and influences of men and women. (Hannan-Andersson, Carolyn (1990). The challenge of measuring gender issues in water and sanitation. Paper presented at the workshop on goals and indicators for monitoring and evaluation for water supply and sanitation, Geneva, 25–29 June.) For example, with regard to evaluating the **adequacy of water quantity, it is important to find out whether men and women have different water uses, whether the water supplied is sufficient** to meet these needs, and if not, **which water uses prevail.** The same may apply to quality criteria, which may be different for women and men.

> **Criteria important for women** *are, for example,* **taste** *and* **suitability** *for* **preparing** *various kinds of* **food** *and* **beverages**, *and* **colour** *and* **softness for clothes washing**. *Some quality standards users apply may also differ from national water quality standards. The acceptable salt content in southern Guinea Bissau for example was below 200 mg/l NaCl, while WHO water quality standards allow up to 1000 mg/l.*

For the **functioning a latrine** projects it may make a difference in performance **whether** felt **needs** and priorities for latrines are **different for men and women**, as well as for **different economic groups**; whether men, women or both are responsible for constructing latrines, finishing outhouses and keeping them in good repair; and who is in charge of cleaning the latrines and supervising their use, both at home and in other places, such as schools.

Such divisions of tasks and responsibility have **implications for design, education and training** and may, when not taken into account, lead to less than optimal functioning. Moreover, they **determine who to involve on what issues** during an evaluation study when investigating latrine coverage, up-keep and hygiene based on the realities of gender influence.

In evaluating the utlization of improved water supplies and latrines, one should look especially at **who collects, stores and utilizes water in the home and in what manner;** how decisions about **management of hygiene, animals and rodent control** are made in the home and in the community, and who has control over income and its utilization, and thus over which type of utensils and equipment is available.

For example, when measuring increased water use, a distinction may have to be made between water collected by men and water collected by women and children. While men collect water much less frequently than women, when they do so they usually have some means of transport, and can thus collect in a single trip much larger quantities for drinking, cooking and hygiene. A participatory evaluation may bring out such aspects and stimulate local action.

> *When the problems of water collection for women and children and the link with family health became clear, men and women in Ngofila village decided to use more donkeys for water collection. This was one of the results of the participatory evaluation on water and sanitation carried out by community development workers in their village and in 56 other villages as the starting point for a regional water supply and sanitation programme.*
> *(United Republic of Tanzania (1984). Project for the development of a community participation component in Tanzanian Rural Water Supply Programme. Final Report. Dodoma, Prime Minister's Office; The Hague.)*

In investigating hygienic use, it may be found that formal authority for hygienic use at water points is vested in male leaders. However, this may in practice make little difference because they seldom visit and use the water points themselves. **More effective hygienic use** may be achieved when **women users make their own management** arrangements and make use of the authority of other leaders when there is a need to do so. Similarly, concerning **hygienic use in the home**, it may be the **woman who is responsible for water storage and drawing, but the decisions for acquiring more hygienic storage facilities may rest with the men**, which clearly has implications for community hygiene education and actions, and for local (self) evaluation.

Participatory evaluations are closely linked to the objectives which projects and communities have set earlier, and which, as discussed already in Module III should preferably be clear and easy to measure. Table 3 gives some objectives which community members may establish for their local programmes and some of the indicators they may use to

motivate and evaluate progress and results. (UNICEF (1985). Programme field manual. Book E, Water supply and Sanitation. Doc. 7403L (Rev.3). New York, UNICEF.)

Table 3
Some examples of objectives defined in behavioral terms and indicators for monitoring and evaluation

Objective:	General use of safe water sources, at least for drinking.
Indicators:	All families live within easy reach of safe water source; no unprotected source in use for drinking; protection of traditional sources, remaining in use.
Objective:	Families will store and use their water under hygienic conditions.
Indicators:	Presence of cover for container, raised platform for container, long-handled dipper to draw water dipper hanging above floor, absence of flies around container, no communal drinking cup.
Objective:	Users will keep area around place of water collection in a sanitary condition.
Indicators:	Adequate drainage, absence of garbage/leaves/sediment/mud from trampling by animals, presence/condition fence, presence/efforts of caretakers, etc.
Objective:	Waste water will be utilized for irrigating vegetable gardens.
Indicators:	Garden around well, in home compound, garden cooperatives formed etc.
Objective:	Drawers of water will clean their containers before filling them with "new" water.
Indicators:	Observed washing inside of container before drawing, washing of leaves/balancers before placing them in containers, etc.
Objective:	All households will have and use a sanitary latrine.
Indicators:	Presence of latrine, absence of soiling; presence of cleaning agents (water, paper in latrine); number of flies; no excreta, including of baby, in compound, etc.
Objective:	Hands will be washed with cleansing agent after toilet use/before cooking and eating.
Indicators:	Presence of water for hand-washing in or near latrine; presence of soap, ash or other cleansing agent near latrine and in kitchen.

Adapted from: UNICEF (1985) and Monitoring System Morogoro/Shinyanga Rural Water Supply and Sanitation Programmes (1990).

When wanting to carry out a minimum evaluation on functioning and use with project staff as a means of assessing the quality of the programme and defining areas for improvement and strengthening, one way of preparation is to organize a training seminar for planning and implementation of an internal evaluation. Guidelines for such a training seminar can be found in the Guide for Course Moderators and the associated course modules of the training course "Evaluating water supply and sanitation projects, published jointly by UNICEF and IRC. (Boot, Marieke (1987). Training course Evaluating Water Supply and Sanitation Projects. Vol. I, Course Modules. Vol. II, Guide for Course Moderators. Guidance materials for a participatory evaluation involving community members as

evaluators of their own community conditions and projects is also increasingly available Feuerstein, M.F. (1986). Partners in evaluation: evaluating development and community programmes with participants. London, UK, Macmillan Publishers.; Rugh, J. (1986). Self evaluation: ideas for participatory evaluative of rural community development projects. Oklahoma, World Neighbours.)

4.3 Evaluating the processes by which results are achieved

Evaluation, and subsequent improvements by solving problems in existing projects, and learning lessons for new projects can be even more effective by investigating the processes by which these results have been obtained.

Two main evaluation questions are:

- **with what processes** of planning and implementation, including of community participation and involvement of women have these results been achieved?
- could results be **improved** by adaptation of these processes, including more or better community participation and involvement of women?

For example, when coverage of a latrine project is low because many households do not participate, it is useful to find out why they have not done so, and whether greater involvement of men and/or women could prevent or solve this. Table 4 gives an overview of some of the reasons and processes which may have played a role.

Table 4
Possible reasons for not participating in a sanitation project and consequences on community participation/involvement of women

MAIN REASON FOR NOT PARTICIPATING	PARTICIPATION PROCEDURES FOLLOWED IN PROJECT
Have not heard about project	Information procedures not using appropriate channels, project methods, materials to reach all men, women.
Reject sanitation project	Priorities of men, women in various target groups not established .
Reject latrine design	Men, women not involved in consultations and testing of appropriate designs and locations.
Cannot afford technologies promoted	No consultation of men, women on range of options, costs and financing arrangements
Do not have the necessary labour	Differences in availability of labour for certain categories (female-headed households, disabled, aged) and possible community solutions not assessed.
Have not got the knowledge, skills or materials	Design not based on local capabilities and task divisions of men, women. Training or technical assistance not included or not accessible to men, women of different target groups.

Adapted from: WHO, Minimum Evaluation Procedures.

To evaluate women's involvement in water and sanitation projects, self-evaluation has worked well in some notable projects, and could be applied more frequently. A recent **INSTRAW report presented the following argument:**

"Self-evaluation is an effective tool in community education. therefore, women and the community should be encouraged to evaluate their own progress in water supply and sanitation activities in order to improve their role in this field".

The use of simple evaluation tools and techniques can make **self-evaluation easier,** as well as an **attractive learning activity for all parties concerned.** An example comes from a project in Indonesia, where participation in local decision-making was evaluated by means of a pocket chart.

The pocket chart had six pictures on top, symbolizing an ordinary woman, an ordinary man, a female leader in front of an audience, a male leader in front of an audience, a water group and a project worker. Underneath each picture was a row of seven pockets. These represented seven questions on decision-making in local project planning and management:

1. *Who makes decisions within the water groups?*
2. *Who selected the group leaders?*
3. *Who decides what activities the group should undertake?*
4. *Who decides the size of monthly contributions?*
5. *Who decides whether the group needed sanctions?*
6. *Who decides where taps, tanks or pumps should be located?*
7. *Who makes the decision about undertaking repairs?*

Each person in the meeting was given seven paper voting cards. The facilitator explained the procedure and asked the first question. Participants voted one-by-one, with the others sitting with their backs to the chart to ensure privacy. The results showed that all decisions were made jointly, with the project worker having particular influence on the location and repair of pumps, taps and water tanks, while female leaders were influential in rate-setting and selection of group leaders, and male leaders on sanctions. (Parker, Deepa (1989). Indonesia: evaluating community management. New York, PROWWESS/UNDP.)

Data collection on women's involvement

Questions that can be investigated in evaluating the process of women's involvement derive directly from the women's roles in project preparation, design, implementation, management, education and training. These have been discussed in the preceding Modules II–IV, and may include:

a) **In project preparation:**

1. Were **women's position and constraints assessed,** and implications for the project drawn?

2. Were the **women** themselves **consulted on their water and sanitation practices,** needs and participation in WSS improvements?

b) **In planning, implementation and training:**

1. Were all categories of **women informed on the project**? If so, did all have a say in the various local planning and design decisions?

2. Are there **women sitting on the existing village water committee** or its equivalent? If so, what is the percentage of women and what role do they play? Are poor women also represented?

3. Are **women consulted on the choice of technology,** the selection of well or pump sites? Are they consulted on additional facilities such as washing, bathing facilities, including their design, financing and management?

4. Are **women involved in decision-making?** In what decision have they got a say?

5. Are **women involved in the construction?** If so, what is the percentage of women's labour in construction? Do women contribute in other ways, i.e. food, laundry, etc.? **Do they take part in financing and management** or only in physical work?

6. Are **women given training in maintenance** of water supply schemes? If so, what is the percentage of women trained as preventive maintenance workers/caretakers/managers of the facilities? What is the turnover rate women as compared to trained men?

7. Is **local hygiene education included?** Are women involved in the planning and implementation? What is the **percentage of women trained, as compared to men?** What is the relative impact made by trained men and women?

c) **In evaluation and follow-up:**

1. Are **women's views on functioning** and use of WSS facilities and education and training activities asked? Are they needed?

2. Do women play an active role in evaluating their own community conditions and planning and implementing improvements?

5. *EVALUATION OF BENEFITS – TO WOMEN AND FROM WOMEN'S INVOLVEMENT*

Evaluation of benefits in water and sanitation projects has **two dimensions.** The **first** one concerns **assessment** of the **impact of the projects on the users,** which to a large extent are women, on their economies, which form an integral part of the overall economic system, and on the presence or absence of unwanted negative side-effects on women's work or positions.

The **second** dimension of **impact evaluation concerns** the **impacts** which **women's involvement** has **had on the projects,** and, in particular, on the **cost-effectiveness of the projects,** in terms of continued adequate functioning and use.

5.1 Project impacts on women

Improved water supply and sanitation **projects** may have many **benefits for women.** They may lead to a **reduction in the time and energy consumed by water collection,** or, where greater convenience and safety make it possible to collect water at any time, an **easier management of their daily tasks** and a **greater use of water for cooking,** cleaning and personal hygiene, and for small-scale production.

a) Comparative studies and women's views

Impacts can either be **measured by comparing conditions before and after the improvement of water supply and sanitation** with, where possible, a control area to account for any influences from other factors and from the measurement process itself, or by comparing villages with and without water or sanitation projects.

> *One example of benefit measurement is a comparison of women's water collection and use in two similar villages on the Mueda plateau in Mozambique. The one had an improved water supply already installed; the other was as yet without one. In the first village, with an average distance of 300 meters to a public standpost, women used two to three times as much water, mostly for bathing, clothes-washing and cooking. Average time savings were 1 hour, 46 minutes. Being the agricultural off-season, most of this time was used for cooking, child-care, hygiene and domestic work. The positive impact on health from greater water use is indicated by a significantly lower incidence of trachoma in children, as found in a health survey by medical students from the national university.*
> *(Cairncross, S. and Cliff, J. (1987). Water use and health in Mueda. Transactions of the Royal Society of Tropical Medicine and Hygiene, 81, 51–54.)*

Other benefits which women derive, especially from their greater involvement in project preparation, planning and implementation processes, and in local management, can be **assessed by reviewing their project roles and asking the women's own opinion.** Benefits thus reported include recognition for their existing roles and skills in water, sanitation and hygiene; learning of new roles; increase in self-confidence and self-esteem; building up women's groups and networks, which provide new learning and mutual support; enhancement of leadership and management capacities of women, including those for planning, conflict-solution, and problem-solving; and undertaking new projects/activities in response to other felt needs and problems. One example of such activities comes from a project in Eastern Kenya.

In a dry area of Eastern Kenya, a national NGO, the African Medical and Research Foundation, assists local communities to improve traditional sources and construct new ones, using both ground water and rain water harvesting technologies. Initiation, implementation and management is done by the communities. The programme's engineer and technical staff help with designs and technical advice and control throughout the process. Women participate actively in project meetings, project management committees and in women's groups, with the support of female project workers. New activities of the women groups include the establishment of communal vegetable gardens and tree nurseries for timber, fruit and fuel at the handpumps, to help meet some of the women's other urgently felt needs for fuel, housing, nutrition and income generation. To reduce domestic fuel consumption and protect watersheds, they have also started to build clay ovens, which have a lower energy consumption and eliminate smoke nuisance and related eye problems. The design of the ovens has been adapted to meet women's conditions and needs, e.g. in the number and size of openings for the cooking pots. The women either employ a local craftsman or build the ovens themselves, taking turns at each others' houses until all group members have been served.

b) Conditions for the productive use of water and savings in time

While the **economic use of water and time** is often mentioned as an **important benefit of community water projects,** such uses and **benefits do not follow automatically.** A review of a number of time-use studies related to water projects indicates that women will only use time and water productively when this is possible and has sufficient advantages for them and their families. In particular, **more substantial income-generation depends on a number of pre-conditions** and additional inputs which must be available to women. These may include: (Wijk-Sijbesma Christine van (1985). Participation of women in water supply and sanitation: roles and realities. (Technical Paper 22). The Hague, IRC and PROWWESS/ UNDP).

1. **considerable and consistent savings in time and water:** water points should be close, give enough water for small-scale productive use and be reliable;

2. **access to means of production:** land, equipment, seeds, animals, extension services, etc.;

3. **access to marketing:** means to collect, transport and market the products, internal quality control,

4. **a good return:** reasonable prices and timely payment to the women themselves.

How important such economic uses of time and water gains may be for the larger economy has already been discussed in Module I, where it was seen that in many areas women are the main foodcrop producers and also have important roles in cash crops and animal husbandry, such as weeding, milking and animal care. Extra income generated from such activities, is often spent on primary family needs including payments for water and latrines and improvement of domestic hygiene. (Van Wijk (1985). p. 102).

Where conditions of productive use of water and time are positive, it may well be worthwhile to:

- evaluate such uses in a quantitative manner. (Roche, Robert and Wright, Frederick (1987). Cost-benefit model for community water supply. Washington, World Bank, International Water and Sanitation Decade Paper).
- determine the amount of extra family income earned in this way; and identify the purposes for which this extra income is used by the women concerned.

c) Evaluation of health benefits and the link with women's involvement

Evaluation of health benefits is usually **difficult and costly.** For one thing, **local health statistics often do not distinguish between users coming from communities with improved water supplies and from those without.** Also, the water supplies may not have been working reliably or they may not be safely, or hygienically used by all. **Incomplete health records, low reporting** to local clinics by some population groups on some diseases and, **unreliable diagnoses** are other frequent **problems in using health statistics.** Where health statistics are adequate, statistics on cholera, diarrhoea, infectious skin and eye diseases, and guinea worm are likely to have been diagnosed most reliably. In such circumstances, comparing diagnosed incidence of one or some of these diseases as a ratio of all reported diseases in an area with and without reliably functioning and generally used water supply and sanitation is one method to evaluate health impact. (Cairncross Sandy et al, (1980). Evaluating for village water supply planning. (Technical paper 15). The Hague, IRC.)

Age and gender-specific diseases incidence also **gives an indication of the effect of the water system on women's water use,** and can be compared with observed or reported practices, especially quantity and quality of collected drinking water (diarrhoeas, guinea worm), clothes washing (schistosomiasis) and washing and bathing of children (skin and eye infections), and with the ways women are involved in planning, design, and management of the local projects.

d) **Evaluating negative impacts on women**

While water and sanitation projects, and the participation processes thereof, can have many benefits for local men and women, they may also have **some negative side-effects on women's work,** influence and position (Table 5). In evaluations, these possibilities should be taken into account, as they may have **serious social and economic consequences,** not only for the women themselves, but also for their families and the wider society, and should therefore be avoided.

Table 5
Domestic water supply and sanitation projects: possible reduced benefits to, and negative impacts on women

1.	Certain categories of women are excluded from access: • poor • minority groups • women heads of household
2.	Greater benefits and development spin-offs have accrued to women from wealthier households, thus widening the gap between rich and poor.
3.	Workload of women is increased by: • voluntary labour for construction • loss of assistance in water collection
4.	Poor women and/or their husbands have lost employment or resources in: • water collection • waste collection and reuse
5.	Women have no control over income from economic use of time and energy and increased availability of water and waste for economic purposes: • agriculture • horticulture • dairy cattle
6.	Special needs of women are not met: • laundry and bathing facilities • service operating hours • privacy • alternatives for meetings and social learning
7.	The involvement of women has been relegated to: • health education • special women's projects
8.	Improved facilities have led to reduction in: • traditional spheres of influence • organizational skills • social status

Source: Van Wijk (1985). op.cit.

For example, improvement of water supplies may lead to the neglect of traditional water sources and the loss of their traditional management systems. When the new systems are not reliable, women, and through them their husbands and children, may then be worse off than before.

There are also cases where **certain categories of women, such as poor women or female heads of households, are excluded from the projects,** or where the work involved leads to an increase in women's workload, without any compensation in kind, cash or status. It may, for example, occur that the man holds the position of caretaker, tap committee member etc., but that the actual work is done by the women in the family.

Another negative impact reported from project evaluation is that while women use time and water gains for productive purposes, such as weeding or cattle keeping, they do not benefit from the increased income from these activities.

> *In milk cooperatives in Rajasthan, India, the women do all the work. However, the men own the animals and are members of the cooperative bodies. An attempt by women to obtain a higher milk price was thwarted by the cooperative's board. Higher prices would have directly benefitted the women, but higher profits and dividends from low prices go to the shareholders, who are all men from wealthier households. In Andhra Pradesh, India, the men abandoned paid agricultural labour when the income from milk started to come in, but the women continued to do both agricultural labour and their work in dairying. Their husbands are the members of the milk cooperatives (euphemistically called "mixed cooperatives"). Gains, or cash from sales or milk for home consumption, go mainly to the men in the households. A few women's cooperatives have now been established.*
> *(Jain, Devaki (1980). Women's quest for power. Sahibadad, Vikar Publishing House.)*

Care should also be taken that emphasis on a **greater involvement of women does not mean that they get to carry the full burden of installation, maintenance and repairs.** Even where women are highly involved, water supply, sanitation and hygiene education projects are community projects and depend on support and participation from all community groups: leaders, men, women, children. However, asking equal contributions from men and women, as in some parts of Zambia and Tanzania, where each adult is asked to pay a flat rate towards local maintenance, may in reality mean greater inequity for women when they have to pay this amount from their own income. Because women's income is almost always smaller than that of male family members, this equal system may in practice means that women contribute a considerably higher proportion of their income than men.

5.2 *Benefits from women's involvement*

In discussing evaluation at an earlier ILO/INSTRAW training seminar in Nairobi, Kenya. (INSTRAW (1987). Women, water supply and sanitation; a national training seminar. Nairobi, Kenya, 9–13 November), participants recommended more evaluation of benefits from women's involvement through a comparison of projects with women's involvement to similar projects without such involvement. The participants also recommended that in evaluating the participation process, **particular attention** should be **paid to the roles of women in maintenance, financing and cleanliness**, and the linkage with income-generation activities. With regard to the impacts of these roles on functioning and use, it was recommended that **emphasis be placed on system performance, preservation of water quantity and quality water use**, including women's water use and storage practices, and on **productive uses of water by women**. As indicators of health impacts, the relationship between increased water use, better personal hygiene and reduced incidence of scabies and eye diseases was thought to be most realistic and measurable. Participation of community people in the evaluation, especially those speaking the local language was recommended.

Another possibility for **impact evaluation** is to **compare construction, functioning and use of a programme** in an area **before the community and women were involved, and afterwards**. The next steps would then be to assess:

- the different roles of men and women in these achievements;
- the costs of the extra inputs by which these results have been achieved (the cost-effectiveness of community participation and involvement of women).

Contributions by the community itself, both men and women warrant special attention in such evaluations. Too often, only the costs of formal staff inputs are taken into account in the evaluation of local contributions. If any contributions of local communities are monitored or assessed, these are usually limited to self-help during construction. In this way, the considerable amount of time and effort spent by community leaders and community men and women on planning, maintenance and management, does not get taken into account. As a result, national contributions to externally supported projects give a wrong impression of the total value of national versus external contributions.

6. *EVALUATION OF PROJECT SUSTAINABILITY AND THE ROLE OF WOMEN*

The long-term goals of water supply, sanitation and hygiene education programmes comprise not only the functioning, use and benefits of improved water supply and sanitation facilities and hygiene practices, but also the capacity to sustain these results and benefits over time.

Thus, evaluating sustainability of water and sanitation projects as defined in Module IV **means assessing or measuring "the ability to keep up the establishment, functioning, use and benefits of improved facilities and practices, without detrimental effects on the environment, also after special assistance has been phased out".**

As no community remains static, **sustainability** can only be **achieved by strengthening problem-solving** capacities in communities and in **partnership agencies** to resolve problems as they arise, and by **addressing changes in demand, interest, capabilities,** finance, natural resources and policies. Because of the supplementary and mutually **reinforcing roles men** and **women** in most cultures play in water supply, sanitation and hygiene, capacity building should exclude neither the one, nor the other.

The **key** in this process of achieving **sustainability** is **building human capacity** both in communities and partnership agencies. Participatory processes, which involve people in making and implementing decisions, become crucial in achieving sustainability. Human capacity development has to take place at the individual level, should reach both men and women and must be evidenced at the group or institutional level. (Narayan-Parker (1990).

Hence, **evaluating sustainability** involves **measuring capacities and development in four main areas**, which need to be considered at the individual (men, women), community and agency levels:

1. Ongoing implementation of functioning and used facilities and hygiene education by agencies and communities;

2. Development of human capacities at community and agency levels;

3. Building of institutional capacity in groups, communities and agencies;

4. Continuation of inter-organizational cooperation.

6.1 Ongoing implementation of facilities and hygiene education

If achieved coverage and service levels are to be preserved, the number of water points and latrines in original project communities cannot remain static, but must continue to grow in relation to population growth. Both old and new water points should produce water reliably and in sufficient quantity and quality throughout the year, and without detrimental effects on water resources and the environment. Therefore, maintenance and maintenance of financing arrangements should be in place, accepted and functioning well. The number of toilets in households, communities, schools and places of work should also increase until full coverage is achieved and preserved. Facilities should be of acceptable technical quality and be hygienically used by all men, women and children in the household, school, etc. Local hygiene improvement programmes should also be continued so that people can gradually eliminate local environmental health risks and, as seen in Module III, both men and women should continue to be involved in such programmes.

To evaluate sustained functioning of water supply, sanitation and hygiene education programmes, several sub-variables can be looked at:

1. on-going installation of good quality water supply and sanitation facilities;
2. on-going effective hygiene education;
3. adequate maintenance systems;
4. adequate cost-sharing and financing arrangements.

Some of the **questions that can be posed** for evaluating on-going installations and effective hygiene education, (items 1 and 2), and the roles of local men and women therein are:

- **Who is responsible** for expanding existing water supplies and latrines in the communities? Are men and women clear about how to get/build new facilities?
- **Do people and agencies** (government, NGOs, private sector) continue to **construct new water systems,** toilets, drainage facilities, etc. to maintain coverage and meet population growth? Do men, women participate in introduction, planning, instruction, management?
- Has the **number of safe water points kept pace** with the **total present population**? Has the number of toilets, or other safe defecation systems for households, school children (boys, girls), marginal groups, increased?
- Have **men and women,** in case of autonomous construction, **received the necessary training,** materials, equipment, technical advice and support?
- What is the **quality of work?** Do new water points, and systems reliably produce water of adequate quality and quantity? Are toilets well-built so as to promote hygienic use? Have men, women continued to be involved in the design, planning, and implementation?
- Have **hygiene activities** involving men, women, children continued?
- Have these **activities led to a further reduction in risky hygiene practices** and have they improved conditions in households, schools, places of work of men and women?

Possible **questions for evaluating sustained maintenance** (item 3) are:

- Have the **roles of communities and agencies** (government, private sector, NGOs) in maintenance and repairs **been defined**? Who are involved as caretakers, mechanics, members of user groups, water and sanitation committees?
- Are **people in the community** (men, women, leaders) **clear** about **their roles**? How do they assess them? Do men, women have the necessary knowledge and skills to undertake maintenance and repairs? Is training provided? Are tools and spare parts available to them?

- Are **maintenance support systems in place and functioning** (through regular maintenance visits, visits by supervision maintenance workers or by local water organization, etc.?). Are records kept on frequency, duration and causes of breakdowns, and on supplies of spare parts?
- Is a **monitoring and back-up system in place and functioning,** to assess the state of maintenance in the project/programme area, provide back-up to problem communities and do repairs beyond community capacity?
- Are **local men, women involved in noting, diagnosing and reporting problems** related to water points? In local maintenance, repairs? In record-keeping of water points functioning and toilet coverage, use, upkeep?
- Is there **an increase in the percentage of reliably functioning systems,** a decrease in frequency of breakdowns, a decrease in average and maximum duration of down-time? How do these figures relate to the type and degree of involvement of men, women in maintenance?

In cost-sharing and financing (item 4), long-term sustainability implies that agency and community have sufficient funds, at least to pay for local operation, maintenance and repairs and, where possible, to finance system expansion, replacement of worn facilities and construction of new ones. Some of the **questions to evaluate financial aspects** are:

- Within the specific context, **what are the per capita unit costs** for a) maintenance b) new construction ? Are they reasonable, affordable to men, women, female heads of household. Are they increasing/decreasing?
- **How is the financing** of maintenance and recurrent costs **arranged?** Are enough funds provided/collected to meet the costs of operation, maintenance, repairs, expansion, replacement, as well as of ongoing instruction? Can latrine subsidies be maintained until all households, schools in the community/project area are served?
- In **case of excessive costs/inadequate resources:** Do communities, agencies have ways to contain costs and/or increase resources? How do men, women generate resources in the communities? For what are resources used?
- **Has cost-sharing been defined**? What is the role of local communities in financing, as compared to the government, NGO? What do local men, women contribute? Are the amounts reasonable and affordable? Are they shared equitably among the various groups of contributors?
- How well **is financial management and control organized?**
- **Who makes decisions at the community level**? Leaders, men and women together? How are accountability to, and influence of, local men, women arranged with regard to services rendered against payment?

Data collection

In participatory evaluation, assessing sustainability will take place at least at two levels. At the **community level,** local men and women **participate in assessing** to what **extent**

they are **maintaining their water supply and sanitation services** and the required conditions for ongoing service (water resources, environmental protection, human resources, finances). Ideally, this is a logical next step deriving from the community's own formulation of project objectives and its monitoring of problems, performance and results over time. At the **agency/programme level, the participating agencies also assess their ability to preserve progress** and results at the area/country level.

An early example of a participatory assessment of the sustainability of a water and sanitation project in which men and women both play distinctive and culturally defined roles comes from Tonga, Polynesia.

> *In 1966 a pilot project was carried out in three villages in Tonga. It consisted in improving sanitation and water supply and in reducing selected environmental health risks. In the first two villages only men participated in project formulation, planning, implementation and evaluation. No women were involved in either planning, execution or monitoring, despite their traditional roles in domestic and community hygiene. As a result, initial improvements found in a first evaluation had come to a standstill at the time of the second evaluation, and, after one year, had totally disappeared. In the third village both men and women were therefore involved. Women were encouraged to attend project meetings. They sat on a women's health committee and took part in discussions on the results of the community hygiene survey, in the setting of objectives, deciding on sanctions, dividing tasks between men, women, and children, and monitoring and evaluating progress and results. In this village, one year later, a water supply had been built and financed, all families had completed and were using latrines, and fly populations had been lastingly reduced.*
> *(Fanamanu, J.; Vaipulu, T. (1966). Working through the community leaders. International journal of health education, 9,3,130–137; also published in Participation and education in community water supply and sanitation programmes, a selected and annotated bibliography. IRC Bulletin 13.)*

6.2 Development of human capacities

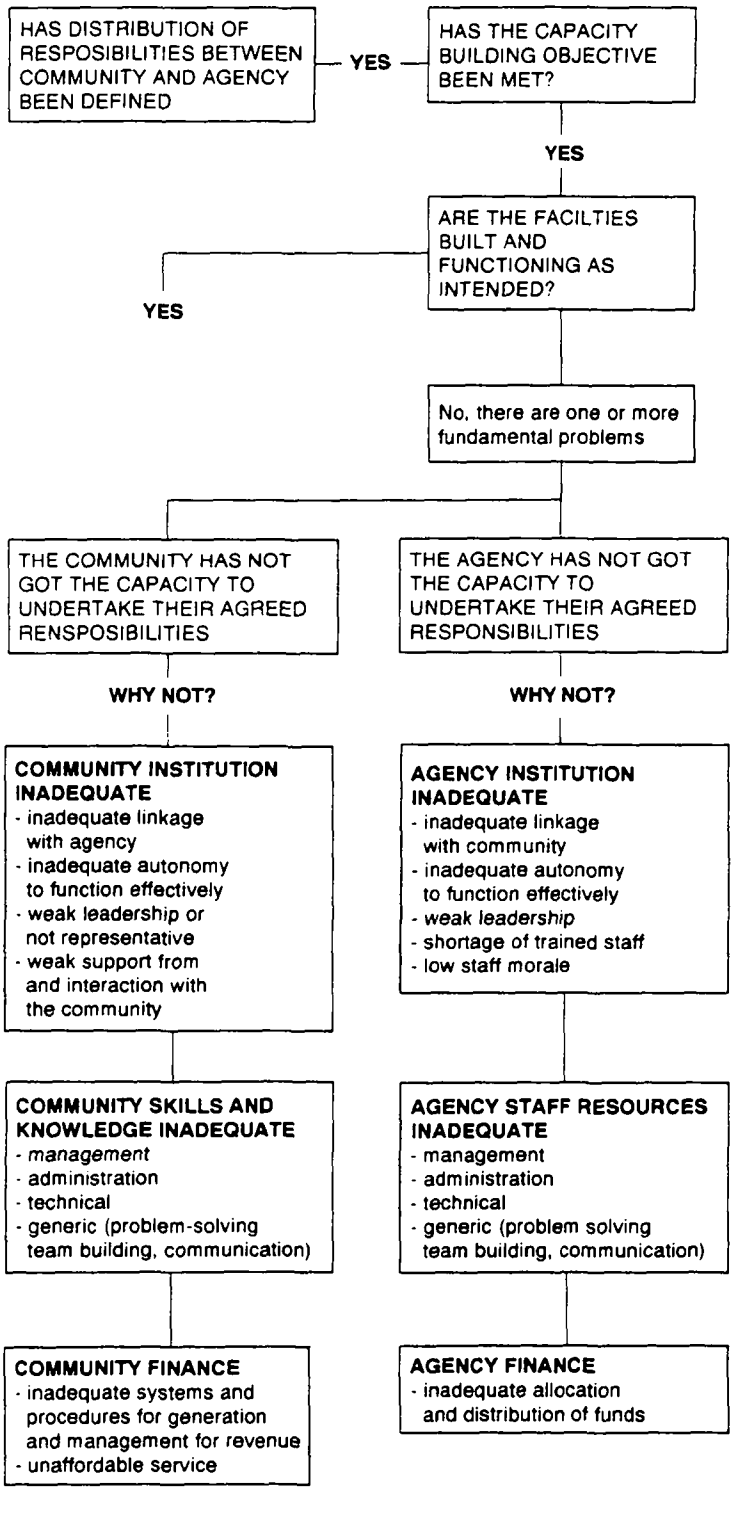
To ensure the progress, results and benefits of water supply, sanitation and hygiene improvement programmes, certain human and organizational capacities will be required. The relationship between these aspects and long-term sustainability is depicted in Fig. 1. **Human capacities** needed for the sustainability of water, sanitation and hygiene **include:**

1. a sufficient number of suitable men and women for the tasks involved;

2. adequate management and leadership capacities among men and women to plan, make decisions, note problems in time, solve problems, be creative, etc.

Figure 1

ASSESSMENT OF HUMAN AND INSTITUTIONAL CAPACITIES FOR COMMUNITY-MANAGED WATER SUPPLIES, SANITATION AND HYGIENE IMPROVEMENT



Adapted from N. PARKER (1990)

3. practical knowledge, skills and techniques needed by women and men to maintain water supplies and latrines, and to manage local water supplies, sanitation programmes and health/hygiene education activities;

4. positive attitudes towards developing the capacities of local men and women, e.g. a sense of commitment, self-confidence and confidence in other men, women, a sense of control over project developments and results.

With regard to human resource development, a **first condition** for sustainability is that at **agency and community level,** a **sufficient number** of suitable **people are present to continue the projects and programmes.** For example, if certain tasks at the community level are carried out by village water or tap committees, data are needed on the number of existing active committees, whether only men or women or both are involved, and what work either category perform in water committees, both in theory and practice.

Possible **issues** to examine when assessing **managerial capacity,** training and confidence at the community level **are:**

- **Do communities take and implement decisions** concerning local water supplies, sanitation, hygiene, water resources, environmental protection? **Have women and men the same management capacities, authority,** relevant knowledge, skills, and self-confidence to take and implement decisions in line with their traditional tasks and authority?
- **What specific knowledge, skills and techniques,** both **analytical** (e.g. early problem detection and diagnosis) and **practical** (e.g. planning, budgeting, accountability) - do men, women need to **maintain and manage water supply,** sanitation and hygiene in their communities? Is training in all required areas available? Have men and women equal access? Is training theoretical or performance-based?
- Do men, women have the required self-confidence and the supportive and stimulating environment needed to enable them to continue to perform their jobs as required?

While some communities themselves possess or develop such managerial capacities, skills and confidence, others depend largely on the ways in which the project agencies are working: whether their methods are imposing or capacity-building, whether their staff feel superior to local men or women or make them feel confident in themselves, whether they bring external solutions or help local men and women take their own well-reasoned decisions. The latter approach is illustrated, among others, in a sanitation project in low-income urban areas of New Delhi, India.

> *Organization was a new idea to the women, and the formation of women's organizations and the program of activities brought them closer together. Many of the men eventually became reconciled to the participation of women inside or outside the project areas, and the women developed feelings of self-reliance. Women became more conscious of their children's health and as they themselves requested the health programmes they more readily accepted them. Attitudes of older women changed also, particularly in allowing their daughters and daughters-in-law to leave their homes to participate in various self-help programs run by the women's organizations.*
> *(Clinard, M. (1977). Slums and community development: experiments in self-help. New York, Free Press.)*

Possible points to examine when **assessing human capacities** and choosing methods and indicators for measurement **may include:**

- whether **projects are managed to achieve construction targets,** or also have objectives on functioning, use and development of benefits;
- **availability of staff** and time for technical as well as non-technical activities;
- **the proportion of female staff,** and the proportion of staff trained with respect to the reasons for, and methods of, women's involvement;
- the **use of non-directive methods,** in all decision-making activities within the community;
- **the existence,** within the implementation agencies, of **participatory training experience and skills** for all fields in which local men and women need to become proficient;
- a belief in the **capacities of local men and women** to manage their own development;
- a **supportive environment,** as indicated by human resource selection criteria, job and task descriptions, job performance criteria, etc. for achieving more than quantitative construction goals.

6.3 Building of institutional capacities

Changes in communal facilities can be initiated by individuals, but sustained only by an organized group, ranging from a small group of water-users to a large government bureaucracy. In order to sustain efforts and results of participatory programmes, strong organizations are needed, not only at the community but also at the agency level.

Three measures to evaluate sustained institutional capacity for carrying out participatory projects with men and women are:

1. Financial and managerial autonomy of the organization;
2. Supportive leadership for men and women;

3. Systems for learning and problem-solving in all agencies and on multiple levels.

> *If user groups, communities and agencies are to be able to sustain improved water supply, sanitation and hygiene education activities,* **one essential condition is sufficient financial and managerial autonomy (item 1)** *to take and implement decisions which, within the agreed division of tasks and responsibilities, keep the systems functioning and used, protect water sources, preserve hygiene improvements, allow the hiring and paying of required workers, formulate and implement rules and regulations, etc.*

An evaluation of agency autonomy involves questions on control over resources (budgets) and management decisions (goals, procedures, staff training), including a determination as to whether these decisions have concerned the involvement of women: as staff, as community members and representatives, in field procedures and in orientation and training courses.

Evaluating autonomy for the communities involves an assessment of which decisions the communities can take themselves, with technical guidance or training from project staff if necessary, and how these are taken and carried out: are they imposed by a particular group, or do men and women, directly or through their representatives, work together? Do low-income women also have a say?

A **second condition** identified for institutional capacity is **strong leadership**, which supports human capacity development and **self-reliance** of both men and women **(item 2)**. This kind of leadership implies such aspects as:

- non-autocratic management;
- a shared vision of the goals, objectives, values and norms of the group or organization, including the roles and involvement of men and women;
- leadership support to men's and women's involvement in decision-making, problem-solving and training;
- emphasis on team-building and team spirit among all team members, men and women;
- the notion that men and women are clear and enthusiastic about their roles, and have sufficient autonomy and means to execute their tasks.

The importance of ensuring that human resources form part of a larger institutional framework and derive strong leadership support is illustrated by a large handpump programme in Karnataka, India.

In Karnataka state, 5000 village women have been trained so far as handpump caretakers. A first evaluation has now been carried out to assess how the women are functioning, and where the programme could be improved. The evaluation showed that the women carry out preventive maintenance and hygiene work, and that they get help from the men for technical maintenance and communication. In general, however, the women work in an institutional vacuum. They lack recognition and support from local leaders, community members and from the engineering department. This lack of support is attributed to the fact that the villages themselves have not been involved in the planning of the maintenance systems, nor informed about the role of the caretakers, and there are no links with local leadership or a water management organization.
(Devi, S. 1988 A study of the effectiveness of women handpump caretakers programme in Bage palli (Taluk, Kolai District, New Delhi, DANIDA).

A **third condition** for achieving strong local institutions is the **establishment of systems for learning and problem-solving (item 3).** To identify and solve problems, a group, community or organization needs information on what is happening; communication, both upwards and downwards, to ensure that information reaches its destination; and capacities (executive, managerial, conflict-solving) for utilizing and acting upon the information.

The preceding modules showed that women's involvement in learning and problem-solving methodologies at group, community and agency-levels is relevant for several reasons:

- as primary users, women notice problems first and are highly motivated to solve them;
- when trained they can note technical problems early, before actual breakdown has occurred;
- in many cultures, women's networks form traditional systems of learning and problem-solving in water supply, sanitation and hygiene.

However, such involvement only comes about when men and women are clear about their roles, and see that their support makes a difference.

When the taps in Zomba, Malawi gave no water, over 80% of the men and women interviewed said that they had not taken any action because they thought that project staff were cleaning the water storage tanks. Only a few women reported that they had contacted the scheme committee (on which they were not represented), or that they had followed the pipes to detect leakages.
(Msukwa, Louis and Kandoole, B.F. 1981. Water by the people: an evaluation of the rural water supply programme in Zomba district. University of Malawi, Centre of Social Research.)I

In assessing men and women's involvement in new learning and problem-solving systems for community water supply, sanitation and hygiene, one can **look at such questions as:**

- **Do information systems exist,** and what role do local men, women play in them? Do men, women know what to look for; do they hold log books, send reports, have representatives contact persons, from tap to project levels?
- Are **lines of communication known to both men and women?** Is information given to, or received from, local users? Are men, women contacted, or both?
- Is **there any evidence of problem-solving,** conflict-handling within the local group, community, organization ? What is the role of local leaders, men, women ? Is the solution effective, without undesirable side effects to men or women?
- **Can a group/agency evaluate itself and take corrective action?** Has it noted a need to implement changes in its activities, processes, or added new components e.g. with regard to the involvement of local men, women?

6.4 Continuation of inter-organizational cooperation and support

In most countries, different organizations are responsible for implementing water supply, sanitation and hygiene education. To sustain results, some continued support will usually be needed for communities and areas served. For example, ongoing adequate functioning and hygienic use of the water systems may require on-going cooperation between the Department of Water and the Department of Energy for a reliable electricity supply, and with the Department of Health for on-going hygiene education and assessment of the quality of drinking water at various points from source to storage vessels.

In the same way, effective involvement of women in the water, sanitation and hygiene programmes will, in many cases, require some kind of small but on-going support, such as periodic visits from skilled project workers who can gauge problems, give support, help with supplementary training, etc. to preserve and enhance the results already achieved. Good on-going coordination between the organizations and staff involved can both lower costs and optimize the effects of such on-going support.

Evidence of on-going cooperation in the field of women's participation may be found from e.g. :

- on-going periodic and coordinated support visits to served communities, in which women and women's representatives are contacted;
- interaction between agencies in identifying areas for further strengthening of on-going programmes (e.g. training, monitoring) and in developing the required inputs concerning both men and women's roles.

7. *EVALUATION OF PROJECT REPLICABILITY*

While sustainability refers to the preservation of results and benefits in a particular project area or community, **replicability refers to the ability of project agencies and communities to implement the same projects in other areas with similar conditions and problems, with little or no dependence on external expertise or funds.** (Narayan-Parker (1990).

Replicability of a project/programme as a whole can be evaluated by examining:

- **Project inputs:** number of staff, time, material and transport which will realistically allow agencies and other communities to repeat the same project in other areas;
- **Institutional setting:** projects are integrated in existing organizational, educational and legal structures in the country and communities; new institutional arrangements, such as water or tap committees, user groups, have a recognized status;
- **Financing:** budgets are realistic and within the financing capacities of the organization or group;
- **Execution:** implementation procedures have been proved effective, are documented and are, or can be generally adopted and applied;
- **Representativeness:** Other conditions (e.g. leadership, cultural setting) are not so unique that the original processes cannot be replicated in/by other communities in the same or other areas.

Looking at the **replicability of women's involvement,** the same kind of evaluation can be carried out. For example, one can ascertain whether water and sanitation projects and programmes have already developed effective methods and techniques for women's involvement which are, or could be replicated in other communities and areas, and whether other women in similar communities are following examples set, without unduly increasing their financial or physical burdens.

The earlier mentioned water and sanitation project in Tonga, for example, was, once found sustainable and seen to be a success, replicated by 18 other communities in the region Fanamanu and Vaipulu (1966). In Kenya, replication of small rainwater collection projects is an on-going process. In Laikipia, twenty-five women's groups have, over a period of four years, built 600 rainwater collection tanks, one for the on average 24 members of each group. Because the women can build, but not travel to learn or train others, a mobile mason comes to train a group on-the-job to build the first three tanks, after which the group gradually builds the others by itself.
(Wacker, Catharine (1990). Participatory development planning for sustainable development with women's groups in Kenya; water projects in Laikipia.)

Another possible **point of assessment** is whether, **exchange of information on experiences and results of women's involvement takes place with other agencies** and projects involved in water, sanitation and hygiene; whether some kind of consensus is developing and is being gradually adopted; whether it is being applied on a wider scale, and whether its lessons are integrated into existing institutional training programmes for water, sanitation and hygiene.

8. *COMMUNITY MONITORING SYSTEMS*

While evaluations help communities and agencies to assess periodically water and sanitation conditions, achievements and problems, **monitoring is a much more on-going activity, involving the systematic collection, registration and analysis, at set intervals, of factual data concerning the programme's implementation and results.**

Monitoring is important because it lays down developments over time in a short and standardized way. **For communities** and groups, **monitoring helps to see whether objectives** they have set are **being reached** and to **note problems in time**, so that underlying causes can be found and problem-solving action undertaken.

> *For example, a community has the objective that by next year, every household will own and use an improved latrine. They have also decided that every two months monitoring visits will be paid to register progress and note if the new latrines are well-built, maintained and used. A first evaluation has shown that 46 households need to improve sanitary conditions. The two-monthly monitoring visits then show whether more, equal or less than eight households have started or completed their latrines in the preceding period, and where problems occur, so that their causes can be found and, where possible, solved.*

The more management capacities the community has, the more creative these solutions may be. In an East-African community, for example, one reason for the stagnation of latrine construction was the unstable soil conditions, causing pits to cave in and latrines to collapse. The only households whose latrines did not cave in were those which had built them on an anthill. The community then decided to share are available anthills, resulting in a noticeable increase in latrine coverage.

For managers of water and sanitation projects and programmes, monitoring is becoming even more important with the coming of community-managed water supplies, latrine projects, and environmental protection and hygiene projects. **Monitoring is not only a practical and time-saving tool** to register developments and identify problems in time, **but is also allows comparisons over time, and between various regions and communities.** In addition it provides important factual data for internal or external evaluations.

An example is the information on frequency and duration of breakdowns of handpumps or communal taps. Where no monitoring system exists at all, an evaluation can only determine the percentage of non-working pumps and taps at the time of inspection. Finding out how long this condition already exists, and whether it has occurred more often and for how long means depending on the memory of the users, with the additional risk that where men are asked, they may give even less reliable answers because they do not actually collect water and visit the pump or tap.

In cases where a local pump- or tap-caretaker keeps a log book, these can be used in programme management and evaluations, to summarize conditions and developments over a longer period and with a greater degree of reliability than when oral recall must be relied upon. This becomes even easier when data can be collected or sent to a higher level at regular intervals, allowing water management at district or provincial levels to keep track not only of agency-installed and -managed systems, but also of performance of community-managed systems and water points in the area concerned.

In addition, besides results, inputs and their costs can also be recorded. This allows, after some time, an evaluation of the cost-effectiveness of locally-managed projects, that is, with what inputs and costs, including those of community participation and involvement of women, particular results relating to functioning, use, hygiene and new development initiatives have been achieved.

When records of inputs and costs cover not only the activities of the implementing agencies, but also the **contributions** in **time, kind and cash from the communities** themselves, a monitoring system makes it **possible to evaluate** more thoroughly the **cost-effectiveness of externally supported projects or programmes,** and allow the integration of the quantified inputs of local men and women into the national share of project financing. These inputs are now seldom reflected in the financing of capital and recurrent costs of improved water supply and sanitation systems, and this give a too low value for the total national contribution to externally financed projects.

8.1 Monitoring and the role of women

Including data on women's involvement in monitoring is important for several reasons. **First,** as women's active participation is so relevant for the success of water and sanitation projects, **agencies may want to monitor to what extent women are involved** in the various project phases and what their influence in these phases is. **Second,** monitoring may have a kind of **eye-opener effect.** This may be especially the case in those situations **where involvement of women is consistently low.** Finding a consistently low involvement of women may stimulate both communities and agencies to make efforts to find out what are the reasons behind this and to take remedial actions. **Third, gender-specific recording** makes it possible to **detect the effectiveness of women's involvement** on systems's performance, by

dividing data on maintenance, management and hygiene into cases with high and low involvement of women and seeing if this makes a difference for project performance.

Typical data which some **agencies** and communities are already **monitoring on women's involvement are:**

- **the total adult population** or number of households in a community, and the **number of men and women participating** in project meetings and self-help activities;
- **the number of men and women** on local water, tap and scheme **committees** and the **functions held by a man or a woman**;
- **how committees are functioning** (committee meetings, site inspections, communication with users, etc.) and to what extent male and female members participate in these activities;
- **how these data relate to management performance** data, such as frequency, duration and causes of breakdowns, setting and collection of tariffs, financing of O&M costs, etc.;
- **whether caretakers, mechanics,** health promoters and other community workers **are men or women**, and whether they function as expected (regular site visits, up-keep logbooks, sending reports, etc.);
- **system's, performance under male and female caretakership**, mechanics, operators, etc.

An example of a gender-specific evaluation of hand pump maintenance comes from two rural hand pump programmes in Bangladesh. (Micro Industries Development Assistance Society, 1984. A comparative study of the caretaker system of the DPHE/UNICEF rural water supply programme and that of the BRDB's village health workers project. Prepared for Socio-economic study project, Dhaka. Unicef and Danida).

In total, 324 handpumps maintained by men and 148 maintained by women were visited. On all parameters reviewed, women performed slightly better than men, as indicated in table 6 below. However, because no monitoring system existed so far, information on breakdowns was based on oral recall of the caretakers over a period of two years, and was therefore unreliable.

Table 6
Performance of handpumps maintained by male and female caretakers in two programmes in Bangladesh (1982–1983).

	Male	*Female*
Broken down (for over six months)	21%	18%
Currently out of order	4.7%	3.3%
Average duration present defect	2.4 months	1.9 months
Reported average frequency breakdowns	2.3 times	1.6 times
Reported average duration breakdowns	4.1 days	3.4 days
Greasing handpump	24%	30%
Greasing 1-2 x/week	5.5%	9.1%
Buy spares in market	61%	81%
Clean platform	77%	88%
Women rated as effective as men	72%	85%

Source: MIDAC (1984).

8.2 Developing community-based monitoring

Good monitoring starts at the community level. Community members such as pump caretakers, water and health committees and community health workers **may already** have **been trained to keep simple records** and monitor and report on the functioning, use and cost-coverage of water supplies and latrines. In several programmes, community members keep handpump log books and water accounts, and monitor and report on latrine installation, use and maintenance.

At higher levels, this village-level **information** is subsequently **condensed into more area oriented and comprehensive data** on, for instance, % of population served, % of reported use and satisfactory hygiene conditions, % of water points not functioning well during the reported period, average and maximum duration of repairs, overall maintenance costs, % of user payment of capital/recurrent cost, and ongoing development activities.

Available **monitoring system** from the community level upward **cannot be established** and maintained **without the active support** and **involvement of the communities** themselves. However, community members will only visit sites and keep records when they appreciate the need for monitoring, have decided who will monitor what, in what manner, how frequently, and with what internal control system. They also need to receive the **necessary training** to implement the chosen monitoring system, and **see the results of their**

monitoring in terms of improved functioning of the water system, improved hygiene and living conditions, and in a better response on the part of government services to local needs and problems.

Much can be said for involving women and women workers in local monitoring systems. Women are the ones who visit pumps and taps daily, and are often involved in financing as treasurers of a water committee. It is often also more culturally acceptable for women to pay home visits on sanitation and hygiene, and for collection of water payments or latrine installments. Moreover, keeping records adds to the visibility and recognition of the physical work and increases its status, and adds to self-confidence and respect, which help people to function better.

But **women's involvement** is only likely to be **successful when attention is paid from the start** to the special position and needs of women. Monitoring formats and log books, for example, will have to be adapted to the lower literacy levels of women. Some kind of records, e.g tap and pump log books may have to be adapted for use by illiterate women, or the women can get help from literate children in making the required notes. **Renumeration will be needed** in cases where **monitoring involves much work**, and women's position and influence on the users and in the management system should be established and accepted.

Steps to develop a participatory monitoring system through a gradual approach of **"learning-by-doing-and-reviewing"** may include the following steps (GTZ (1989):

- **The project discusses the relevance of monitoring with men and women** in the first project communities (members of village committees, water and health committees, women committees, local caretakers, health caretakers);
- **Agreement is reached on who will collect what information** and with what frequency, including the question of internal and external supervision and control;
- **Methods of data collection are agreed** on, e.g. visits to pump/tap sites, intake, school latrines; home visits to follow up latrine installation; review meetings of village water health committee; scheduled visits of agency staff;
- **Agreement is reached on how information will be registered** and disseminated, log-books/minutes printed, formats mailed/collected and reviewed on the spot;
- **Workload and need for renumeration are reviewed;**
- **Monitoring forms and records are field-tested and practical training is given** on how to keep them;
- **Users are aware of how maintenance,** management and hygiene will be monitored and accounted for, and what users themselves can do (e.g. when not satisfied with the operation of the system);
- The agreed **monitoring systems is tested during a selected period;**
- **Experiences are reviewed,** the system is adapted where necessary, and **expanded to the next group of communities.**

Monitoring itself should **not involve much paperwork** and at the village level should be suitable for people with low literacy. **Only data** that are used and **acted on should be collected,** to avoid the collection of large amounts of unused information, and to show the communities that their work has influence. Also, **indicators** chosen for testing **should be directly related to the short-and long-term objectives of the project** or programme. The development of community-based monitoring is thus a gradual and participatory learning process which results in a practical, field-tested system.

9. *CONCLUSION: EVALUATION AND MONITORING AS MANAGEMENT TOOLS*

Evaluation and monitoring of water and sanitation projects have become **important management tools.** They **serve to improve** the **implementation of projects,** and especially their effective life after completion of the installation works. As a result, the character of **project evaluations** is changing. They become less an external judgement tool on whether investments have been well-spent, and more a **means to learn from ongoing programmes, and improve project inputs and processes. Monitoring** helps in doing this by **providing the project management with regular and factual data on key indicators of progress and results.** Table 7 gives an overview of these developments.

There are a **number of key questions** in this type of evaluation and monitoring. A first set of questions focuses on project performance in technical and hygiene education projects. **Are the technical projects and hygiene education implemented as intended,** that is, at the right progress, costs, quality and acceptability to the intended users?

Are they also functioning as intended, that is, do water systems give water reliably, of an acceptable quantity and quality? Are sanitation systems working, maintained and kept clean? Are hygiene education programmes reaching target audiences, understood, realistic and in answer to local needs and culture? And finally, are facilities and education used as intended, that is, by all, consistently and in the right way?

A second set of questions focuses on community participation in the technical and health education process. **With what forms of community, and women's involvement, are the project results achieved?** Could a greater or better involvement lead to better results? What implications does this have for the own staff, programme, implementation procedures?

The evaluation of women's involvement focuses, on the one hand, on the way women take part in local planning, management, evaluation and training, and whether these roles should be improved, and on the other hand on the impact projects have on women's work and position in their households and communities. The latter is done by looking at these issues both before and after the project, and/or asking the women's views. Issues receiving attention include improved water use and hygiene practices, reduction of time and efforts for women and children, effects of projects on women's activities, status, skills and self-

esteem, enhanced cooperation between women for better services and community life, and the avoidance of negative project impacts on women, such as loss of traditional management roles and increase of voluntary work without accompanying status, renumeration and authority.

Table 7
Evaluation and monitoring of water and sanitation projects

	Evaluation	*Monitoring*
Why	Learn from ongoing projects Improve plans and execution Improve results	Guide implementation Detect and solve problems Follow performance after completion
When	At specific stages in the programme	Ongoing activity
What	Project output and costs; Functioning of completed systems; Use of completed systems; Effect on hygiene conditions and practices; Impacts on women and socio-economic development	Project progress, costs, community contributions; Functioning of completed systems; Selected hygiene conditions and practices; Involvement of local men and women
How	Minimum evaluation (MEP) studies; Comparative studies (before-after, with or without control community)	Community-based monitoring system
Who	Project staff, with involvement of community	Community members, with support from project staff

A third set of questions looks at the sustainability and replicability of these results over time. **Have communities and agencies developed the capacities to preserve the good functioning, use, hygiene improvements and other local development over time?** Do they continue to install new facilities and undertake hygiene education in the initial project communities to meet population growth and keep up present levels of coverage? Do they replicate projects in other, similar areas with the same approaches and results, including those in women's involvement?

Evaluation on such issues takes place at regular stages in the programme cycle, e.g. after the pilot phase, after handing over a new batch of projects, and some time after having handed over each project batch. **Monitoring,** on the other hand, **takes place throughout time on a scheduled basis.** It provides project management with important data for day-to-day project steering as well factual inputs for specific evaluations. On women's involvement, project management will be particularly interested in knowing to what extend women already take part in local planning, implementation, maintenance and management of water and sanitation projects and hygiene education activities, and what effects this involvement has on project functioning, use and impacts.

With the increase of **community-managed systems,** both **evaluation and monitoring** are gradually **becoming a joint activity of agencies and communities.** For monitoring, key community members, such as local caretakers, water committees and community health workers may keep simple records and send in monitoring forms on the functioning of the water systems and the construction, maintenance and use of latrines, especially when they see that these efforts lead to better and more appreciated results in their community as well as the programme. Self-evaluation, or local involvement in external evaluation activities, brings the users' experiences into the evaluation and helps people to take their own corrective actions afterwards.

In both monitoring and evaluation, women and women workers are important partners in the participation process, as they have **personal experience with local water and sanitation conditions** and much of the work involved is socio-culturally appropriate for them. However, this can **only** be **effective** when in the **design of evaluations and monitoring systems, their roles are already taken into account** and provisions are made enabling them to participate. Training of all those involved in monitoring and evaluation as to why and how to involve women in these activities, as well as more pilot projects in these fields thus **becomes necessary.**

Background reading No.1: PURPOSE OF EVALUATION
Source: Boot, Marieke (1987). Training course evaluating water supply and sanitation projects. Course Modules. The Hague, IRC, and UNICEF.

Background reading No.2: ONE STEP AT A TIME: WHO'S MINIMUM EVALUATION PROCEDURE
Source: Schulzberg, Gunnar, et al. (1990). One step at a time: WHO's Minimum Evaluation Procedure for water supply and sanitation projects.

Background reading No.3: MONITORING AND EVALUATION OF WOMEN'S PARTICIPATION
Source: Perrett, Heli (1985). Involving women in sanitation projects. TAG Discussion Paper No. 3. Washington D.C., World Bank/UNDP Project INT/83/003.

Background reading No.4: ROLES OF WOMEN IN WATER SUPPLY AND SANITATION: A PROGRAMME CHECKLIST
Source: WHO (1985). Women, water and sanitation. Geneva, World Health Organization.

Background reading No.5: EVALUATING AND MONITORING HYGIENE EDUCATION
Source: Relick, G. and Fry, Sarah (1990). A training guide on hygiene education. Technical Report No.60. Arlington, Washington.

Background reading No.6: REVIEW OF DECADE IMPACT ON WOMEN'S INVOLVEMENT
Source: Elmendorf, Mary (1990). The IDWSSD and Women's Involvement. Geneva, World Health Organization.

Background reading No.7: EDUCATION CASE: WOMEN IN THE DODOTA WATER PROJECT, ETHIOPIA
Source: Poluha, Eva (1990). Dodota water supply project, Ethiopia. Development Journal, 3, 39–43.

Background reading No.8: REPORTS FROM INSTRAW NATIONAL AND REGIONAL TRAINING SEMINARS (ETHIOPIA, NIGERIA, SOMALIA, SUDAN AND ASIA AND PACIFIC REGION)
Source: UN/INSTRAW (1987-1989), Women, Water Supply and Sanitation. Santo Domingo, Dominican Republic.

Background reading No.9: CONSULTATIVE MEETING ON EVALUATION METHODOLOGIES FOR PROGRAMMES AND PROJECTS ON WOMEN DEVELOPMENT
Source: UN/INSTRAW, Report by the Director of Institute, INSTRAW/BT/1990/CRP.1, 21 December, Santo Domingo, Dominican Republic (1989).

Background reading No.10: PARTICIPATORY EVALUATION: TOOLS FOR MANAGING CHANGE IN WATER AND SANITATION
Source: Narayan-Parker Deepa (1990), issued by UNDP/ PROWWESS, WHO, JOINT UNDP/WB Programme, New York.

Background reading No.11: MINIMUM EVALUATION PROCEDURE
Source: WHO (1983) Report No. ETS/83–1, CCD/OPR/ 83–1, Geneva, World Health Organization.

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4. Cairncross, Sandy and Cliff, J.: **Water use and health in Mueda.** (1987).

5. Casley, Dennis and Lury, Dennis: **Monitoring and evaluation of agriculture and rural development projects.** Baltimore, John Hopkins University Press (1982).

6. Clinard, M.: **Slums and country development: experiments in self-help.** New York, 1977.

7. Devi, S.: **A study of the effectiveness of women handpump caretakers programme in Bage palli (New Delhi),** DANIDA, 1988.

8. Fanamanu, J., Vaipulu, T.: **Working through the community leaders.** International journal of health education (1966).

9. Feuerstein, M.F.: **Partners in evaluation: evaluating development and community programmes with participants.** London, U.K. (1986); Rugh.J.: **Self-evaluation: ideas for participatory evaluation of rural community development projects,** Oklahoma (1986).

10. German Agency for Technical Cooperation (GTZ). **Indicators for success. Community participation and hygiene education in water supply and sanitation, how to measure progress and results.** Frankfurt, 1990.

11. Hannan-Anderson, Carolyn (1990). **The challenging of measuring gender issues in water and sanitation.** Paper presented at the workshop on goals and inclinators for monitoring and evaluation for water supply and sanitation. Geneva.

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14. Msukwa, Louis and Kandoole, B.F.: **Water by the people: an evaluation of the rural water supply programme in Zomba district.** University of Malawi, 1981.

15. Narayan-Parker Deepa: **Participatory Evaluation: Tools for Managing Change in Water and Sanitation,** issued by UNDP/PROWWESS, WHO, UNDP/WB Programme, 1990.

16. Narayan-Parker.Deepa: **Indonesia: Evaluating Community Management, A Case Study**, UNDP/PROWWESS, 1989.

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20. UN/INSTRAW: **Women, Water Supply and Sanitation: National Training Seminar,** Nairobi, Kenya, 9-13 November 1987, INSTRAW.

21. UNICEF: **Programme Field Manual Book E, Water Supply and Sanitation.** Doc 7403L (Rev. 3). New York, 1985.

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1. List the major areas for improvement of evaluation methodologies on WID.

2. List the basic differences between conventional and participatory evaluations procedures.

3. List the main concepts of community based evaluation and monitoring.

4. How can the project impacts and benefits from women's involvement be improved?

NAME OF PARTICIPANT

.....

INSTITUTION

.....

OCCUPATION

.....

COUNTRY

.....

DATE

.....

Mark the box which corresponds best to your opinion on each question.

1. Your professional interest in the particular topic included in this modular unit was:

   high ☐ ☐ ☐ ☐ low

2. The objectives of this module were:

   clear ☐ ☐ ☐ ☐ not clear

3. Would you say that the objectives of this module met all, some or none of your expectations?

   3.a) Which objectives were not met?

3.b) Explain briefly why the objectives were not met.

4. The contents of this module were:

well structured ☐ ☐ ☐ ☐ badly structured

4.a) If they were badly structured, explain why.

5. The terminology in this module was:

easy to understand ☐ ☐ ☐ ☐ hard to understand

6. The visual material (slides, drawings, diagrams...) used in this module was:

clear ☐ ☐ ☐ ☐ confused

useful ☐ ☐ ☐ ☐ useless

7. The checklists have covered the subject studied:

completely ☐ ☐ ☐ ☐ not at all

8. The checklists were:

useful	☐	☐	☐	☐	useless
too simple	☐	☐	☐	☐	too complicated
sufficient	☐	☐	☐	☐	insufficient

9. Studying this module enabled you to learn:

many new things	☐	☐	☐	☐	nothing new

10. The knowledge acquired through this module will, in your present profession be:

useful	☐	☐	☐	☐	useless

11. The knowledge acquired through this module will, in the near future be:
(Reply to this question only if the answer to question no. 10 is negative)

useful	☐	☐	☐	☐	useless

12. List the topics you would like to have treated more extensively:

1) .....

2) .....

3) .....

13. List the topics you would like to have treated to a lesser extent:

1) .....

2) .....

3) .....

14. List the topics not included in this module which you think are of particular interest to your profession:

    1) .....

    2) .....

    3) .....

15. List any suggestions for improvement of this training module:

    .....

    .....

    .....

    .....

    .....

    .....

This evaluation questionnaire should be sent to:

UN/INSTRAW,
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SANTO DOMINGO
The Dominican Republic

TRAINER'S GUIDE

HARDWARE

1. Overhead projector
2. Screen
3. Slide projector, 24 mm with synchroniser
4. Blackboard
5. Flipcharts (optional)
6. Tape recorder

DOCUMENTS TO BE USED BY THE TRAINER

See "Module Structure", page 3

DOCUMENTS TO BE DISTRIBUTED TO TRAINEES

WV-1.1: Target groups

WV-1.2: Objectives

WV-2.1: Table of contents

WV-2.2: Text

WV-2.3: Additional reading

WV-2.4: Bibliography

WV-3.1: Checklists on key issues for group work

WV-3.2: Evaluation questionnaire

KEY POINTS	TRAINING METHOD AND ACTIVITIES	DOCUMENTS TO BE DISTRIBUTED	AUDIOVISUAL SUPPORT MATERIAL
INTRODUCTION			
1. Objectives	Presentation		Sound/slide package: "The Involvement of Women in Evaluation and Monitoring of WSSP"
2. Evaluation methodologies for programmes and projects on WID	Presentation/discussion		
PRESENTATION			
3. Areas for improvement of evaluation methodologies on WID	Presentation/discussion		WV-1
4. Monitoring and evaluation of WSS projects	Presentation		WV-2 WV-3 WV-4 WV-5
5. Minimum Evaluation Procedures (MEP)	Presentation		WV-6 WV-7
6. Evaluation of benefits of women's involvement	Presentation/discussion		WV-8 WV-9 WV-10 WV-11
7. Evaluation of project sustainability	Presentation		WV-12 WV-13
8. Evaluation of project replicability	Presentation		WV-14
9. Community monitoring system	Presentation		WV-15
10. Evaluation and community as management tools	Presentation		WV-16
SUMMARY			
11. Key issues checklists	Group discussion	Checklists WV-3.1	
MONITORING AND CONTROL			
12. Module evaluation questionnaire	Individual activity	Questionnaire WV-3.2	

NAME OF TRAINER .....

COUNTRY ..... **DATE** .....

AVERAGE EDUCATIONAL QUALIFICATIONS OF PARTICIPANTS .....

.....

.....

.....NUMBER OF PARTICIPANTS .....

Mark the box which corresponds best to your opinion on each question.

1. To what extent has the module achieved the objectives stated?

☐ over 80%

☐ 70 – 80%

☐ 60 – 70%

☐ 50 – 60%

☐ less than 50%

2. Did the objectives meet the needs of the group?

totally ☐ ☐ ☐ ☐ not at all

3. On the basis of the objectives stated, the subject matter is:

relevant ☐ ☐ ☐ ☐ irrelevant

4. The progression of the subject matter is:
(Give reasons for your answers)

too fast ☐ ☐ ☐ ☐ too slow

5. List the topics you would like to have treated in the package more extensively:

   a) .....

   b) .....

   c) .....

6. List the topics would like to have treated to a lesser extent:

   a) .....

   b) .....

   c) .....

7. List the topics not included in this module that you think should be included:

   a) .....

   b) .....

   c) .....

8. The technical quality of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

9. The relevance of the audiovisual material was:

   high ☐ ☐ ☐ ☐ low

10. The quantity of the audiovisual material was:

    high ☐ ☐ ☐ ☐ low

11. The sound/slide package (where applicable) was:

    too long ☐ ☐ ☐ ☐ too short

12. Your global evaluation, bearing the objectives and teaching resources of the module you have tested in mind is:
(Give reasons for your answer)

excellent ☐ ☐ ☐ ☐ mediocre

After completion, please forward this document to:

UN/INSTRAW,
P.O. BOX 21747
SANTO DOMINGO
The Dominican Republic

WV-1: Areas for improvement of evaluation methodologies on WID

WV-2: Functions of evaluation

WV-3: Functions of monitoring

WV-4: Difference between conventional and participatory evaluations

WV-5: Purposes of participatory evaluations

WV-6: Minimum evaluation procedures (MEP)

WV-7: Possible reasons for not participating in a sanitation project

WV-8: Contribution of women to results

WV-9: Evaluation checklist

WV-10: Impact of project on women

WV-11: Domestic water supply and sanitation projects

WV-12: Project sustainability

WV-13: Assessment of human and institutional capacities for community-managed water supplies

WV-14: Project replicability

WV-15: Management of information system

WV-16: Evaluation and monitoring of WSS projects

TRANSPARENCIES

AREAS FOR IMPROVEMENT OF EVALUATION METHODOLOGIES ON WID

- EFFECT/IMPACT ANALYSIS
- DATA BASES
- COST EFFECTIVENESS OF DATA COLLECTION
- TYPES OF EXPERTISE AND EVALUATION
- HUMAN/CULTURAL FACTORS IN EVALUATION
- FEEDBACK AND FOLLOW-UP
- TRAINING
- PARTICIPATORY EVALUATION
- PURPOSES OF EVALUATION
- INSTITUTIONAL CONSTRAINTS
- SUSTAINABILITY
- COMMUNITY-BASED APPROACH

FUNCTIONS OF EVALUATION

BEFORE: JUDGEMENT ON WHETHER FUNDS WELL-SPENT

NOW: MEANS OF LEARNING AND MANAGEMENT TOOL TO IMPROVE ON-GOING PROJECTS AND PLANNING OF NEW PROJECTS

FUNCTIONS OF MONITORING

- ON-GOING ACTIVITY
- COLLECTION OF INFORMATION ON IMPLEMENTATION AND FUNCTIONING OF PROJECT
- ENABLES TO FOLLOW THE PROGRESS OF PROJECT
- COLLECT FACTUAL DATA AS INPUTS FOR PERIODIC EVALUATIONS

TABLE 1
DIFFERENCES BETWEEN CONVENTIONAL AND PARTICIPATORY EVALUATIONS

Who	External experts.	Community, project staff, facilitator.
What	Predetermined criteria of success, principally costs and production output.	Room for people to identify their own indicators of success, which may include production outputs.
How	Focus on scientific objectivity; distancing of evaluators from other participants; uniform through complex procedures; delayed limited access to results.	Self-evaluation, simple methods adapted to local culture; open immediate sharing of results; local involvement in evaluation processes.
When	Usually upon completion; sometimes also mid-term.	Merging of monitoring and evaluation; hence regular small evaluations.
Why	Accountability, usually summative, to determine if funding continues.	To empower local people to initiate, control and take corrective action.

Source: Narayan-Parker, 1990

TABLE 2
PURPOSES OF PARTICIPATORY EVALUATIONS

Purpose	Community	Agency
Evaluation	Assessment of project processes and results.	Assessment of project processes and results.
Improvement	Deciding what problems still exist and what the community will do to solve them.	Deciding what problems still exist and what the agency will do to help the community solve them.
Revision		Adaptation of project planning, implementation and training in the light of lessons learned.
Diffusion		Informing others on experiences to enhance knowledge and reduce or prevent project failure.

MINIMUM EVALUATION PROCEDURES (MEP)

- **ARE WATER SUPPLY/SANITATION FACILITIES FUNCTIONING AS INTENDED?**
- **ARE THE FACILITIES USED CONSISTENTLY AND HYGIENICALLY BY ALL?**
- **IS HYGIENE EDUCATION FUNCTIONING AS INTENDED?**
- **ARE IMPROVED HYGIENE PRACTICES USED BY ALL?**

TABLE 4
POSSIBLE REASONS FOR NOT PARTICIPATING IN A SANITATION PROJECT

MAIN REASON FOR NOT PARTICIPATING	PARTICIPATION PROCEDURES FOLLOWED IN PROJECT
Have not heard about project	Information procedures not using appropriate channels, project methods, materials to reach all men, women.
Reject sanitation project	Priorities of men, women in various target groups not established .
Reject latrine design	Men, women not involved in consultations and testing of appropriate designs and locations.
Cannot afford technologies promoted	No consultation of men, women on range of options, costs and financing arrangements
Do not have the necessary labour	Differences in availability of labour for certain categories (female-headed households, disabled, aged) and possible community solutions not assessed.
Have not got the knowledge, skills or materials	Design not based on local capabilities and task divisions of men, women. Training or technical assistance not included or not accessible to men, women of different target groups.

Adapted from: WHO, Minimum Evaluation Procedures.

CONTRIBUTION OF WOMEN TO RESULTS

- **WITH WHAT PARTICIPATION OF WOMEN ARE PROJECT RESULTS ACHIEVED?**

  - **IN TECHNICAL PROJECTS**
  - **IN HYGIENE EDUCATION**

- **COULD MORE/IMPROVED WOMEN'S PARTICIPATION LEAD TO BETTER RESULTS?**

EVALUATION CHECKLIST

ARE WOMEN.....

- **INVOLVED IN PROJECT PREPARATION?**
- **CONSULTED ON THE CHOICE OF TECHNOLOGY, ADDITIONAL FACILITIES, LOCAL MAINTENANCE, MANAGEMENT, FINANCING SYSTEMS?**
- **SITTING ON WATER COMMITTEES? WHAT PERCENTAGE? WHAT ROLE DO THEY PLAY?**
- **TRAINED IN PREVENTIVE MAINTENANCE, MANAGEMENT, REPAIRS, LOCAL CONSTRUCTION? WHAT PERCENTAGE?**
- **TRAINED AS HEALTH/HYGIENE PLANNERS, EDUCATORS, MANAGERS?**
- **TAKING PART IN LOCAL EVALUATIONS AND PLANNING OF IMPROVEMENTS?**

IMPACT OF PROJECT ON WOMEN

- **DO WOMEN DERIVE ECONOMIC BENEFITS?**
- **CAN WOMEN USE THE TIME SAVED/ RELIABLE WATER SUPPLIED FOR OTHER DEVELOPMENTAL ACTIVITIES?**
- **DO WOMEN ACHIEVE HYGIENE IMPROVEMENTS?**
- **DOES THE PROJECT INFLUENCE WOMEN'S CONFIDENCE AND SELF-ESTEEM? ARE PROBLEMS SOLVED, NEW ACTIVITIES UNDERTAKEN?**
- **DO WOMEN RECEIVE ANY INCOME?**
- **DO WOMEN LEARN NEW SKILLS?**

TABLE 5
DOMESTIC WATER SUPPLY AND SANITATION PROJECTS

1. Certain categories of women are excluded from access:
   - poor
   - minority groups
   - women heads of household

2. Greater benefits and development spin-offs have accrued to women from wealthier households, thus widening the gap between rich and poor.

3. Workload of women is increased by:
   - voluntary labour for construction
   - loss of assistance in water collection

4. Poor women and/or their husbands have lost employment or resources in:
   - water collection
   - waste collection and reuse

5. Women have no control over income from economic use of time and energy and increased availability of water and waste for economic purposes:
   - agriculture
   - horticulture
   - dairy cattle

6. Special needs of women are not met:
   - laundry and bathing facilities
   - service operating hours
   - privacy
   - alternatives for meetings and social learning

7. The involvement of women has been relegated to:
   - health education
   - special women's projects

8. Improved facilities have led to reduction in:
   - traditional spheres of influence
   - organizational skills
   - social status

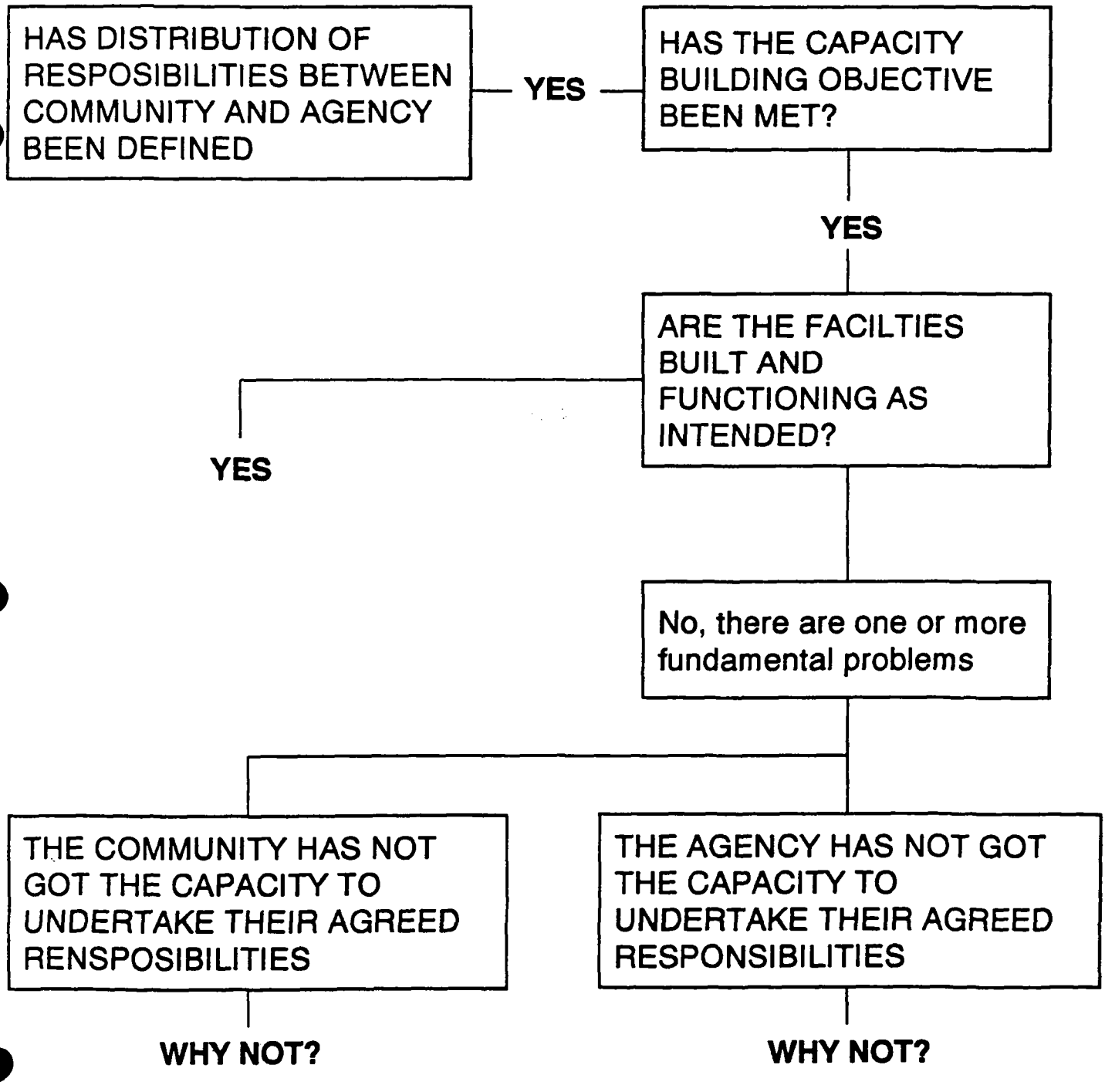
Source: Van Wijk (1985). op.cit.

PROJECT SUSTAINABILITY

- **HAVE AGENCIES AND COMMUNITIES DEVELOPED CAPACITIES TO PRESERVE GOOD FUNCTIONING, USE AND HYGIENE?**

- **DO AGENCIES AND COMMUNITIES PRESERVE COVERAGE LEVELS IN PROJECT AREAS AFTER PROJECT COMPLETION?**

ASSESSMENT OF HUMAN AND INSTITUTIONAL CAPACITIES FOR COMMUNITY-MANAGED WATER SUPPLIES, SANITATION AND HYGIENE IMPROVEMENT



WHY NOT?

COMMUNITY INSTITUTION INADEQUATE
- inadequate linkage with agency
- inadequate autonomy to function effectively
- weak leadership or not representative
- weak support from and interaction with the community

COMMUNITY SKILLS AND KNOWLEDGE INADEQUATE
- management
- administration
- technical
- generic (problem-solving team building, communication)

COMMUNITY FINANCE
- inadequate systems and procedures for generation and management for revenue
- unaffordable service

WHY NOT?

AGENCY INSTITUTION INADEQUATE
- inadequate linkage with community
- inadequate autonomy to function effectively
- weak leadership
- shortage of trained staff
- low staff morale

AGENCY STAFF RESOURCES INADEQUATE
- management
- administration
- technical
- generic (problem solving team building, communication)

AGENCY FINANCE
- inadequate allocation and distribution of funds

Adapted from N. PARKER (1990)

PROJECT REPLICABILITY

- **CAN/DO THE COMMUNITIES, HOUSEHOLDS, AREAS IN THE SAME CIRCUMSTANCES REPLICATE THE PROJECT?**
- **WITH THE SAME PROCESSES AND RESULTS, INCLUDING WOMEN'S INVOLVEMENT?**

MANAGEMENT INFORMATION SYSTEM

DOES THE PROGRAMME HAVE A MANAGEMENT INFORMATION SYSTEM WHICH ALLOWS FOR MONITORING OF:

- DEGREE OF WOMEN'S INVOLVEMENT?
- EFFECT OF WOMEN'S INVOLVEMENT ON PROJECT RESULTS?
- EFFECT OF PROJECT ON WOMEN AND WOMEN'S ROLES IN DEVELOPMENT?

TABLE 7
EVALUATION AND MONITORING OF WATER AND SANITATION PROJECTS

	Evaluation	*Monitoring*
Why	Learn from ongoing projects Improve plans and execution Improve results	Guide implementation Detect and solve problems Follow performance after completion
When	At specific stages in the programme	Ongoing activity
What	Project output and costs; Functioning of completed systems; Use of completed systems; Effect on hygiene conditions and practices; Impacts on women and socio-economic development	Project progress, costs, community contributions; Functioning of completed systems; Selected hygiene conditions and practices; Involvement of local men and women
How	Minimum evaluation (MEP) studies; Comparative studies (before-after, with or without control community)	Community-based monitoring system
Who	Project staff, with involvement of community	Community members, with support from project staff