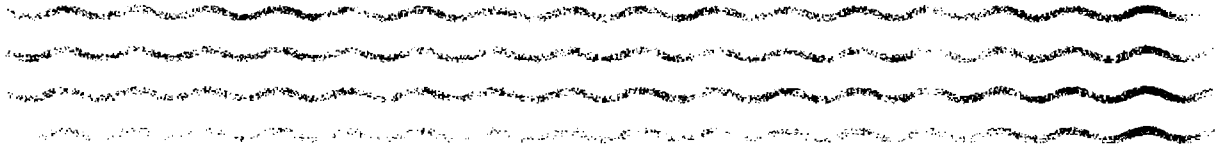
ST/TCD/16

Natural Resources
Water Series No. 25

Promotion of Women's Participation in Water Resources Development

Report of the Seminar
Bamako, Mali
14-18 November 1988



Technical Co-operation for Development

United Nations

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Department of
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FOREWORD

During the course of the International Drinking Water Supply and Sanitation Decade (IDWSSD), 1981-1990, the role of women as managers of water within the household and as the persons responsible for health and hygiene at the family level has increasingly been recognized. Policy makers, planners and managers are now concerned with ensuring that women benefit from water and sanitation programmes and that their knowledge, experience and commitment are employed to make programmes more effective.

Recognizing the important role that women play in water supply and sanitation activities, the Steering Committee for Co-operative Action for IDWSSD set up a Task Force on Women and IDWSSD in 1982. The United Nations Department of Technical Co-operation for Development (UN/DTCD) has been actively involved in the Task Force since its inception and has contributed to the development of strategies for enhancing the role of women in water and sanitation activities at the country level. In line with Decade priorities, UN/DTCD, in co-operation with the Government of Mali, decided to sponsor an interregional Seminar on the Promotion of Women's Participation in Water Resources Development, as part of its regular programme activities. The Seminar was held from 14 to 18 November 1988 in Bamako, Mali, and was attended by over 80 representatives from 20 French-speaking countries in Africa and other developing regions, international organizations, donor countries and non-governmental organizations. It was the first international seminar on women and water held for French-speaking developing countries, providing the first opportunity for many of the participants to exchange views and experiences with women from other developing countries.

The Seminar reviewed new approaches developed over the course of the Decade, including technologies and non-technological measures; participation of women and the community in the operation and maintenance of water supply and sanitation facilities; self-financing of water projects; income-generating activities related to water; training techniques; and measures to improve domestic water quality and health.

It was acknowledged that the role of women in the water sector is particularly crucial in the Sahelian countries, which have suffered most acutely from shortages of both financial and water resources. Sahelian women have generally borne the burden of development in rural areas and are the key to sustainable development in those countries. The combined efforts of women, non-governmental organizations and the respective countries of the Sahel in the water sector were highlighted in case studies.

This publication contains the conclusions and recommendations of the Seminar participants, as well as summaries of the papers presented by consultants and country participants. The Department is grateful to Mrs. Ruth Baméla Engo-Tjéga for assisting in the preparation of this report.

CONTENTS

INTRODUCTION

The United Nations Department of Technical Co-operation for Development (UN/DTCD) and the Government of Mali organized a Seminar on the promotion of women's participation in water resources development. The Seminar was held from 14 to 18 November 1988 at Bamako, Mali. It drew more than 80 participants representing 20 French-speaking countries in Africa and other parts of the world, donors, and non-governmental organizations. The country representatives included social development, health and civil engineering officials who had a particular interest in the development of water resources.

The Seminar's main objective was to promote the participation of women in all areas of water supply programmes so as to improve the effectiveness, reliability and quality of water supply. Indeed, it is women who are the principal managers of water within the household and who are primarily responsible for family and community hygiene.

OPENING MEETING

At the Seminar's opening meeting, the representatives of UNDP, UN/DTCD and the National Union of Malian women (Union nationale des femmes maliennes (UNFM)) each made an important statement.

Mr. Gautier, the UNDP Resident Representative observed that "with the International Drinking Water Supply and Sanitation Decade drawing to a close, the current initiative was important for several reasons:

> "(1) First, because when the United Nations General Assembly decided to proclaim an International Drinking Water Supply and Sanitation Decade, it was known that during the two remaining decades of the century it would be necessary to improve water supplies for about 1.8 million human beings a year if the target of 100 per cent coverage of the inhabitants of developing countries was to be reached;
>
> "(2) Second, although the percentage of rural inhabitants having access to drinking water was known to have increased during the first half of the Decade, only in Asia was progress rapid enough to suggest that the water needs of nearly all of that continent's rural population would be met by the end of the century;
>
> "(3) Third, since women are the primary users of water at home and in the fields, their role in water use is clearly vital, particularly since they are responsible for the family's food, nutrition and health."

Ms. Kadia Tagola Diakité, the UNFM representative, began by greeting all the participants. She stressed that the topic of the Seminar was of great interest to her organization.

> "Indeed, in Mali, a Sahelian country, supplying water to villages is a crucial matter. Village women are obliged to walk many kilometres in order to provide their families with water, for this chore is left to them. During certain times of the year, it is often difficult to find water for drinking

and cooking. In such conditions, daily bathing and washing of clothes become a luxury. Yet without water, there is no hygiene and no health, no development is possible, and survival itself is threatened. For water is life."

She concluded by saying:

"The National Union of Malian Women plays a very important role in the village water programmes in Mali. Of the UNFM activities in this area, the alerting of women to the importance of using clean water is of paramount importance: for water taken from drilled wells is clean when it is drawn, but it is polluted by the time it is used. This is one of many problems which can be solved only by a long-term effort, to which our Organization is firmly committed."

Ms. Karen Dreher, the seminar co-ordinator, speaking on behalf of UN/DTCD, said she was pleased to welcome all the participants to "charming Bamako". She outlined the reasons for choosing Mali as the host country and the goals of the International Drinking Water Supply and Sanitation Decade:

"... I consider it entirely appropriate that this Seminar is being held here, since Mali has been a guiding light for the water projects carried out by our Department in French-speaking Africa. The goodwill of the Malian people and their support for the Department's efforts during the last 20 years played a big part in our decision to hold the Seminar here.

"Let us remember that the initial goal of the International Drinking Water Supply and Sanitation Decade (1981-1990) was to provide all with access to drinking water and sanitation services by the year 1990.

"The Decade's guiding principle is that drinking water and sanitation are a basic human right and that people in developing countries should not be condemned to live in conditions where polluted water and insanitary conditions are responsible for the majority of diseases and for a short life expectancy.

"Unfortunately, the global economic recession of the early 1980s severely reduced the funds needed to execute water supply projects and programmes, particularly in Africa. As the level of available funds diminished, it became clear that it would be necessary to rely increasingly on less costly solutions, such as the use of hand pumps, and on self-financing by communities, in order to cover the costs of investing in, operating and maintaining water systems."

Ms. Dreher drew the attention of Seminar participants to the following points regarding the Decade:

"One of the most important lessons learned during this period has been that the key to success in a rural water project is to make the users participate in its planning, implementation and maintenance. These users, who oversee household water supply and hygiene in most developing countries, are women. As household managers, women are directly concerned by the improvement of water supply and of sanitation equipment. They also have a better awareness and understanding of what needs to be done. It is therefore essential that women participate in the identification, start-up, operation and maintenance of facilities as well as in health education."

Recognizing the contributions of other United Nations organs, Ms. Dreher said that women's participation has been encouraged by the PROWWESS (Promotion of the Role of Women in Water and Environmental Sanitation Services) project and by the Working Group on women and water of the Steering Committee in charge of promoting co-operation for the Decade, of which UN/DTCD is an active member. A technological innovation in Burkina Faso of which UN/DTCD can be proud is the famous "pousse-pousse" wheelbarrow, developed with the aid of the United Nations Development Fund for Women (UNIFEM), which makes transport of goods far easier for women.

CLOSING MEETING

A highlight of the closing meeting was the statement by Mr. Drissa Keita, Mali's Minister of Industry, Water and Energy.

He emphasized, among other things, that "our States' common denominator, as the first International Drinking Water Supply and Sanitation Decade draws to a close, is undoubtedly the fact that only a small percentage of our populations' water needs is being met and that sanitation systems corresponding to generally accepted norms are almost non-existent".

Before thanking UNDP and UN/DTCD on behalf of the Malian people, his Party and his Government, the Minister noted, with regard to the sharing of the costs of facilities:

> "We consider water to be a commodity for which one pays. The user populations are already mobilized to participate in the normal functioning and maintenance of water production systems. Needless to say, such an approach, depending as it does on a direct contribution organized by the populations themselves, needs to be refined. The ideas exchanged during your Seminar will surely enable us to achieve this. May I remind you that until recently, this whole process was considered a social mission of the public sector. The sacrifices to which such an approach gives rise and its non-viability make a revision necessary, since it penalizes both the State and the as yet unserved populations."

I. SUMMARY REPORT: CONCLUSIONS AND RECOMMENDATIONS

Despite the significant gains and laudable efforts made during the International Drinking Water Supply and Sanitation Decade (IDWSSD), the Seminar conducted a detailed study of the problems which had emerged during the Decade with a view to assessing post-Decade prospects. It recognized that the participation of local communities and of women was not only fundamental but had to be pursued at a time of economic and financial crisis which was forcing most African countries to adopt a policy of gradual disengagement on the part of the State. In the light of that situation, the Seminar participants identified the following general problems:

A. General problems

1. On the conceptual level, the need to redefine the notion of women as the primary users of water.

2. On the quantitative level, the following obstacles were noted:

- Increase in the population
- Drought
- Persistent water control problems in the Sudano-Sahelian zones
- Lack of water management in humid areas
- Need to increase the supply of water for household use and for production needs

3. On the qualitative level, the need for a clear definition of water quality and of the technical and logistic support of monitoring teams.

4. On the technological level, the need to adapt technologies to the problems to be solved.

5. On the participation level, the need to adopt an approach which will enable the local population to solve its own problems.

After identifying those general problems, the participants recommended the following measures:

1. Access to water should not be thought of as a right of women but as a community development need. Consequently, the expression "women as the primary users of water" should be replaced by "Women as providers or managers of water", to distinguish between the rights and duties of women.

2. Quantitative water planning should take into account not only household use but also production and processing needs (agricultural production, food production, cottage industry ...).

3. The chemical and bacteriological composition of the water should be monitored on a regular basis in order to prevent degradation of water quality. To that end, an ongoing dialogue should be maintained not only among trainers but also between trainers and trainees with a view to developing positive attitudes towards hygiene and sanitation based on an understanding of the concept of water quality.

4. Technologies should be chosen in collaboration with the users on the basis of the following: adaptability, cost in relation to available resources, accessibility and easy maintenance. Priority should be given in all cases to local technologies.

5. Any participation-based approach must be guided by full regard for the resources, responsibility and initiative of the users. Accordingly, the participation of women in water management should not be limited to those who attend voluntary manual labour or meetings sessions. It must go beyond the conventional gender differentiation between tasks and reach a level of collective sharing of decisions and responsibilities which will ensure the success of the programme of activities. A prerequisite for any effective user participation is the ability of the trainers to convert people from mere users to promoters and activators of their own development.

The Seminar participants then clarified their positions by examining the following specific themes:

1. Improvement of water resource use and equipment maintenance

2. Training

3. Cost recovery

4. Co-ordination among the various people involved.

B. Recommendations

1 (a) Given the many difficulties encountered by populations in operating water equipment more research should be done with the aim of developing simple locally produced technologies to be replaced gradually over time by more advanced technologies.

1 (b) Technical training should continue to be provided in order to develop the technical skills of the community members.

1 (c) Warehouses for spare parts should be established and detailed information on the location and price of spare parts should be provided.

2 (a) Governments should develop a water supply and sanitation policy and provide the resources needed to implement it at the national, regional and local levels.

2 (b) Local communities should launch educational programmes and introduce community services (income-generating cultural activities) that respond to the needs of the people and call for their active participation.

2 (c) Training should be so organized as to be sure that the messages conveyed reach all members of the community: women, men and children.

2 (d) This training should be carried out by social workers with leadership skills.

2 (e) Educational measures should include instruction in installation of testing equipment and field trips. Men and women should have equal access to these opportunities.

2 (f) Water distribution and sanitation projects should provide adequate resources for the training of technicians, local craftsmen and users.

3 (a) Before launching a water supply and sanitation project, the community should provide the necessary resources for the establishment of a security and maintenance fund.

3 (b) All Committee members should receive management training in the rational utilization of funds. All members of the community should also be trained in the rational utilization of these funds.

3 (c) As a matter of priority trained technicians and well-diggers should be used to create jobs and reduce the costs of installing and maintaining equipment.

3 (d) Governments should promote the formation of co-operatives and small- and medium-sized businesses (SMBs) to install and maintain water supply and sanitation systems.

4 (a) Governments should reduce the number of types of equipment and, to the extent possible, use the same equipment in a given geographic or administrative district in order to facilitate delivery of spare parts. They should grant high priority to improving the skills of local craftsmen so as to create a core of local workers skilled in the manufacture and maintenance of equipment.

4 (b) The various agencies involved in the water and sanitation sector, including non-governmental organizations, should be encouraged to co-ordinate their activities and to take full advantage of experience acquired in the field.

4 (c) Closer co-operation between resource donors and international organizations is also desirable.

C. Analysis of problems and approaches

This Seminar made it possible to gather a wealth of knowledge and experience in various areas which will be extremely useful for government and non-governmental officials.

The discussion was enlivened by many presentations drawing attention to the lessons learned from the various approaches developed in the course of the Decade, thus enabling all the participants to exchange views and rethink their positions.

II. SUMMARY OF PRESENTATIONS

WATER SUPPLY AND WOMEN IN THE AFRICAN RURAL SYSTEM: SEVERAL SUGGESTIONS TO BE CONSIDERED

Patrizia Paoletti (TCDC Consultant)

The village water supply system provides an opportunity for transformation, a step in the process of change in the traditional community. Women are at the core of this process because they are the ones responsible for getting the water. Water user groups can play a very significant role in promoting the participation of women in the decision-making process. But it is not simply a question of adding one, two or even several women to the management committees; they must have a decisive role in determining policy from the planning stage to the management of water points. The socio-economic impact of water points on the status of women can be measured by direct indicators - opportunities for increasing income from livestock-breeding and small irrigated plots and by indirect indicators - reduced work-load, improvement of village sanitary conditions. Certain sanitation programmes require efforts which are not immediately recognizable as useful, so that the women go back to using traditional wells whenever difficulties arise. But a new awareness can be generated if the changes in sanitary conditions and the connection between health and sanitation are clearly demonstrated. Drinking water supply projects offer a chance to move from tradition to innovation; the opportunity should not be missed.

EXPERIENCE OF THE UNITED NATIONS DEVELOPMENT FUND FOR WOMEN (UNIFEM) IN THE PROMOTION OF WOMEN'S ACTIVITIES FOR WATER RESOURCES DEVELOPMENT

Jacqueline Ki-Zerbo (UNIFEM)

After identifying UNIFEM, which was established in 1976 pursuant to a decision by the United Nations General Assembly, Mrs. Ki-Zerbo reviewed the specific contribution of UNIFEM in the area of water resources development.

Given the time and energy expended by women on chores involving water, UNIFEM has promoted a number of activities. To mention only a few:

1. The "pousse-pousses" in Burkina Faso (1984)

Burkina Faso took a revolutionary step in deciding to allocate 24 per cent of development plan investments for 1986-1990 to water programmes, particularly at the village level. In conjunction with UNDP/TCDC, UNIFEM provided assistance to support the production of "pousse-pousses" - wheelbarrows equipped with four containers capable of carrying 80 litres at one time instead of the 20 litres normally carried by women in one container.

This project, which involved 131 villages, had the following characteristics:

(a) Time and energy saved by women was invested in educational and income-generating activities;

(b) Community organization for the exportation of "pousse-pousses";

(c) Creation of small and medium-sized business (SMBs) run by women for the rental of "pousse-pousses";

Indicators of the success of the project are as follows:

(a) The "pousse-pousses" are used on a regular basis in the villages.

(b) There is a great demand for additional "pousse-pousses".

(c) The construction of "pousse-pousses" has continued after completion of the project.

(d) "Pousse-pousses" may be useful in other projects involving the transport of water and of raw materials for processing.

2. The Kenya Water for Health Organisation (KWAHO) project in Kenya

In 1983, within the framework of the Promotion of the Role of Women in Water and Environmental Sanitation Services (PROWWESS), UNIFEM collaborated with UNDP to provide two sociologists to the non-governmental organization, "Kenya Organisation for Water and Health". The two sociologists improved communication with the people by training five women village leaders who, in turn, trained other women in the village to mobilize the community for the maintenance and use of water distribution systems.

The factors that account for the success of the KWAHO project have been identified as follows:

(a) Establishment of real co-operation between the Government and KWAHO based on mutual respect and complementarity;

(b) Flexibility in the execution of the project;

(c) Institutionalization of positive strategies;

(d) Choice of an appropriate technology;

(e) Commitment of the community to assume responsibility for operating the water distribution network;

(f) Practical on-site technical training of men and women technicians selected by the communities;

(g) Clear definition of the responsibilities of the project management staff;

(h) Training of all those involved in methods based on community participation.

DRINKING WATER SUPPLY

SOCIAL ASPECTS AND COST RECOVERY

A. Mathys (African Development Bank (AfDB))

AfDB is a financial institution whose task is to ensure that projects are economically viable. It is experienced in the water and sanitation sector and particularly in cost recovery in situations involving poor management by utilities companies, poor service or non-payment of bills by users, in this case mainly the administrative services. AfDB provides support for projects being funded to ensure that the poorest consumers have access to the system. It also supports a policy of having consumers pay part of the costs to avoid waste. It discourages long-term government subsidies of recurrent costs.

STRUCTURE AND TYPE OF PARTICIPATION BY WOMEN AND THE COMMUNITY

Victoria Mojekwu (World Health Organization (WHO))

While water is important for human life, it must be acknowledged that water is also the vector of many diseases (gastro-enteritis, schistosomiasis, malaria, cholera, etc.).

WHO has adopted the primary health care approach and is guided by the following principles:

1. Water-sufficiency to improve primary health care,
2. Complementarity between supply and sanitation,
3. Priority for under-served urban and rural populations,
4. Complete coverage owing to a programme that can be replicated,
5. Participation of users, in particular women, at all stages of project preparation,
6. Promotion of inter-sectoral collaboration,
7. Definition of the role of social (community) personnel,
8. Collaboration between social workers and government services.

In carrying out its activities, WHO respects national sovereignty and merely provides technical support for programme preparation and training. Its task is made easier when the State explains its needs clearly and makes a political commitment to promote inter-sectoral co-operation.

EXAMPLE OF PRACTICAL TRAINING INVOLVING COMMUNITY PARTICIPATION

Ayele Foly (TCDC Consultant)

The Family Welfare Advisory Service was established with support from a non-governmental organization, the "World Neighbours" ("Voisins Mondiaux"). This Advisory Service has been operational since 1979 and collaborates with several international organizations, on request, in Togo and in other countries.

Its objectives are:

1. To assist social development projects in the West Africa subregion;

2. To provide valuable support and advice to political leaders, organizers and managers on the best way to generate real community participation (particularly the participation of women).

Its activities consist of:

1. Determining the real needs of communities and families;

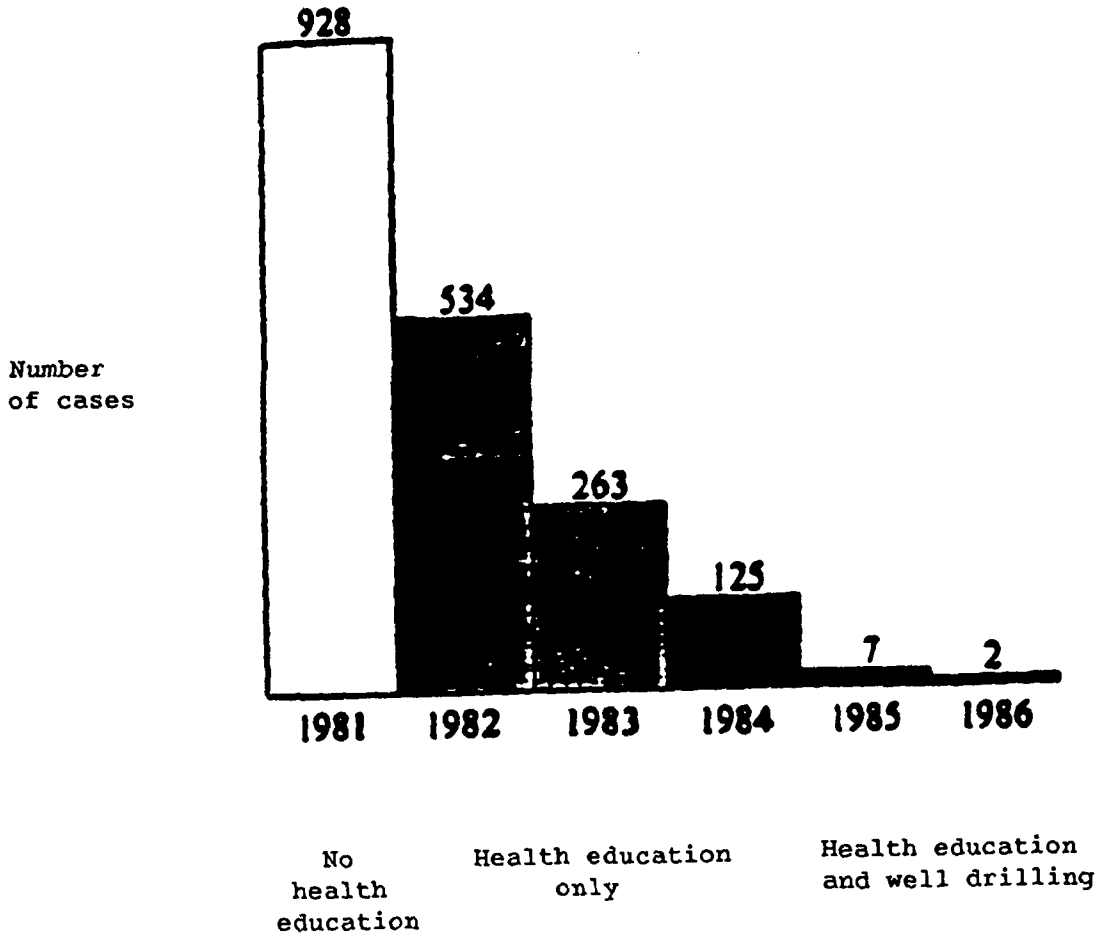
2. Identifying the attitudes and other root causes of problems and developing possible solutions for families;

3. Training local supervisory personnel;

4. Promoting family health through maternal and child care, environmental sanitation and adequate drinking water supply.

Application of the community participation method enabled the village of Kati (Togo) to eradicate the Guinea worm in five years (see graph, p. 11).

INCIDENCE OF GUINEA WORM IN KATI, TOGO
FROM 1981 TO 1986



APPROACHES RELATING TO THE INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE. POINT OF VIEW OF THE ENGINEER

Claude Sauveplane (DTCD)

Knowledge about water resources in the Sahel has been substantially expanded as a result of a body of information acquired at the raw data level (even though it is not homogeneous). There has also been an improvement in prospecting methods (successful drillings in zones considered to be difficult) and definite technological progress on appropriate pumping systems.

However, the provision of good quality water was not as successful and will require special attention in years to come. To be specific, complete chemical and bacteriological analyses will have to be made when the water point is established and at regular intervals thereafter. Lastly, it must be pointed out that the lack of criteria for data gathering, storing and processing by country and by climatic subregion is a serious limitation.

However, the greatest limitation on village water projects is without a doubt the crucial failure to give consideration to effective participation by the user communities.

WOMEN, WATER AND SANITATION

STRUCTURES AND TYPES OF PARTICIPATION

Aminata Traoré (PROWWESS) (UNDP)

The relatively late recognition of the role of communities and women in water supply and sanitation projects has led to selective, partial and often coercive forms of participation. The most advanced form is the establishment of joint water point management committees with a percentage of women lower than, equal to or higher than that of men, depending upon the projects. These committees raise a number of questions that could usefully be clarified. To what extent are existing social and cultural practices being violated? Who are the women who participate in these committees, and how are they selected? What training do they get? What educational support is available to them? The identification of structures and types of participation is a basic question.

The following tables give a general idea of some of these problems.

STRUCTURES AND TYPES OF PARTICIPATION OF WOMEN IN WATER SUPPLY AND SANITATION

Structures of participation	Types of participation expected	Observations
Political organizations		Advantages
National women's unions and associations	- Sensitization of decision-makers and participation in decision-making - Definition of sectoral policies and strategies - Mobilization of resources for their implementation - Analysis of needs - Education, sensitization and training of members of the organization at different levels	- Presence in all the countries - Politically influential - Presence throughout the territory Difficulties - Lack of training and means - Mobility of supervisory staff and, occasionally, lack of time Strategy - Education, sensitization of women managers - Training of selected managers in communication techniques and community participation methods - Mobilization of funds for the financing of small projects at the neighbourhood and village level

Structures of participation	Types of participation expected	Observations
Workers' organizations		Advantages
Modern sector	- Education and sensitization through the media and in the exercise of the profession	- Ability of health and community development workers to understand the problems of the sector
Association or trade union of nurses, midwives, grass-roots health workers including illegal midwives, etc.	- Grass-roots training	
	- Periodic visits and home counselling	
Rural community organizers	- Support of production activities	- Some training experience
Unstructured sector		Difficulties
	- Collection of funds	
Organization of women in business	- Upkeep and maintenance	- Lack of information and training
Organizations of women farmers, craftsmen, etc.	- Holding of meetings	Strategy
	- Construction and upkeep of water points and latrines at the workplace	- Education and sensitization of the officers of these women's organizations
		- Organization of training workshops for those whose qualifications, experience and availability facilitate the implementation of projects
Economic organizations		Advantages
Co-operatives	- Exchanges of information and sensitization	- Experience in organizing self-help
Tontines	- Collection of funds for upkeep and maintenance	- Skill in managing financial resources
Mutual assistance groups	- Support for income-producing activities (training, credit ...)	

Structures of participation	Types of participation expected	Observations
	- Participation in the education and instruction of population groups and of women at the grass-roots level	Difficulties
		- Do not exist in all countries
	- Construction and upkeep of water points and latrines at the workplace	- Lack of training
		Strategy
		- Education and sensitization
		- Training workshops
		- Income-producing activities and credit
Social, cultural and religious organizations		Advantages
Religious organizations	- Exchange of information and sensitization at the organizational level	- Motivation
Neighbourhood associations		- Homogeneity: linguistic
Social and cultural associations (dances)	- Participation in analysing project needs and project planning, monitoring and evaluation	- Availability
		- Meeting places often established
	- Role of volunteers in the education and instruction of women	Difficulties
		- Do not exist in all countries
	- Collection of funds	- Source of cohesiveness but also of exclusiveness
	- Upkeep and maintenance	- Lack of information and training
		Strategy
		- Education and sensitization within organizations

Structures of participation	Types of participation expected	Observations
		- Intensive training of individuals to serve as "relays" for communication techniques - Production of training material for use by persons serving as "relays"
<u>Training structures</u>		<u>Advantages</u>
Women's centres, clubs and homes Day nurseries Literacy courses Schools	- Information and exchanges of views - Identification and analysis of needs - Participation in the production of training material - Achievements: water point management and construction of latrines - Role of people serving as "relays"	- Water problems often included in the programme - Existence of meeting places - Motivation <u>Difficulties</u> - Lack of training and training material <u>Strategy</u> - Education and sensitization - Training of trainers in participation methods - Funding of micro-projects (construction of water points and latrines) - Demonstration material

Structures of participation	Types of participation expected	Observations
Households	- Pooling and exchange of information	<u>Advantages</u>
	- Analysis of needs	- Awareness of a responsibility to be assumed
	- Planning	
Water points	- Payment of fees	- Existence of a meeting place for discussion
	- Upkeep of water points and latrines	<u>Difficulties</u>
	- Participation in sanitation (disposal of waste and waste water)	- Women's work schedule
	- Education and instruction of children	- Lack of regular access to men and sometimes women
	- Evaluation of project activities	- Periodic visits
		- Follow-up and evaluation

ORGANIZATIONAL APPROACH

Jocelyne Bazile-Finley (UNDP)

Communities, and women in particular, must be involved in all phases of water supply and sanitation projects, including:

(1) Planning

(2) Design

(3) Construction

(4) Operation

(5) Choice of materials

(6) Upkeep

For example, "gift pumps" are usually not repaired by the users.

APPROACHES DESIGNED TO OBTAIN ADDITIONAL REVENUE FROM WATER RESOURCES

Scholastique Kompaoré (DTCD Consultant)

It is well known that activities that have traditionally been the prerogative of women are monopolized by men when they become remunerative.

The use of water resources in Burkina Faso is no exception to this rule. For a long time men have spontaneously managed, either individually or in groups, to exploit dams and ponds to sink shallow wells for dry-season crops and livestock breeding. Hydro-agricultural development policies have only accentuated that trend. There is a new trend, however, since 1982, which aims at including women in the management and control of water resources. In this connection, the allocation of plots to women in the Douna development plans and particularly the Nahouri soil management project are specific examples. Finally, Burkina Faso's agreement to participate in the PROWWESS project clearly demonstrates the Government's desire to help increase women's participation in the management, upkeep and repair of water points.

Today these results prove that despite the control of water sources by men, women, aided most often by NGOs, have proved that they are competent to manage water points and make good use of them.

APPROACHES FOR IMPROVING THE QUALITY OF HOUSEHOLD WATER AND HEALTH

Victoria I. Mojekwu (WHO)

Fatoumata S. Maïga (Department of Public Health and Sanitation) (Mali)

Cheick T. Tandia (Department of Public Health and Sanitation) (Mali)

There have long been techniques for improving the quality of water, ranging from the most refined treatment methods in large centres (flocculation, settling, chlorination, fluoration, etc.) to the most primitive in the villages and households (filtration, boiling, chlorination, use of ashes and of certain leaves, roots or bark or of curds, etc.). These techniques must frequently be improved and studied before they are universally applied, particularly among women whose role is to provide drinking water.

Experience has shown that the availability of drinking water alone does not substantially improve the health of the population unless it is accompanied by sanitation programmes, including widespread use of improved latrines, sanitary collection or treatment of waste and disposal of waste water. That is why the Government of Mali now requires every water project to include a sanitation component.

There is a growing need for periodic monitoring of water quality not only from springs but also from water storage tanks. Simple portable equipment can be used for that purpose; it does not require a high degree of technical skill to perform the analyses.

1. The disinfection of well water

Wells must be disinfected before they are put into service. Chlorination is the best means of disinfection. The recommended disinfectant is calcium chloride, which is readily available in stores. The usual dose is 25 g per m^3 of well water. A double dose is used for very murky water. The following table may be used to calculate the quantity of water in a given well.

Diameter of well	m^3 of water per metre of depth
0.6 m	0.263
0.75 m	0.440
1 m	0.88
1.5 m	1.8
2 m	3.14

The quantities indicated in the right-hand column must be multiplied by the water level in the well (expressed in metres) to obtain the quantity of water in m^3.

Disinfection alone following construction work is not enough to provide good-quality water in the long term. In order to avoid contamination by the equipment used to draw up the water when the well is used, the well should be disinfected regularly, using the following materials:

2. Disinfection by the water cooler method

This requires:

a. A water cooler or earthenware jug with a capacity of 10 to 15 litres (this is available everywhere in Mali),

b. Coarse gravel,

c. Medium-fine gravel,

d. Chlorinated lime,

e. Sand,

f. A residual chlorine comparator.

All these materials are washed and disinfected before the operation.

3. Preparation of chlorinated lime

One m^3 of water requires 1.5 kg of lime, 4 litres of disinfectant bleach and 3 kg of sand. In an aluminum or galvanized iron container, mix 1.5 kg of powdered lime and 4 litres of 120-chlorometric disinfectant bleach and 3 kg of sand. After these three ingredients have been mixed, set up the apparatus.

4. Starting the disinfection procedure

a. Ten holes 0.5 cm in diameter are drilled in the bottom of the earthenware jug.

b. A layer of medium-fine gravel is placed on top of a layer of coarse gravel,

c. The mixture of chlorinated lime and sand is then poured over the gravel,

d. The earthenware jug is then filled with medium-fine gravel.

5. Immersion of the water cooler in the well

The filled water cooler is then immersed in the well and held beneath the surface of the water, preferably close to the wall of the well and hooked on to it. The quantity of chlorinated lime varies directly with the volume of water in the well. This method has been tested in several countries in Africa; the

following table shows the results of the experiment in Tunisia. It presents advantages, but is difficult to apply because the supply of quicklime, chlorine, sand and gravel varies from region to region.

6. Disinfection of water points using the water cooler method with chlorinated lime (Ministry of Health of Tunisia) (1983)

Regions	Length of effectiveness of the water cooler expressed in days*	Bacteriological result
1	18	Clean
2	12	Unclean
3	17	Clean
4	18	Clean
5	18	Clean
6	16	Clean
7	40	Clean
8	30	Clean

* The length of effectiveness of the water cooler expressed in days is measured on the basis of a residual chlorine content greater than 0.2 m/l.

The total cost of disinfection using this method comes to 15,660 CFA francs per well. Transport and labour costs can by reduced by passing them on to the community.

WOMEN IN THE SAHEL DESERTIFICATION CONTROL CAMPAIGN: STUDY OF EXPERIENCE IN SIX COUNTRIES: BURKINA FASO-CAPE VERDE-MALI-MAURITANIA-NIGER-SENEGAL

Marie Monimart (DTCD)

1968-1988: Twenty years of drought in the Sahel have brought about an ecological, social and economic disruption that has further exacerbated an already disastrous situation. Women perceive desertification as a drastic and irreversible change - nothing will ever be the same - and they know that they must learn how to change the way they live in this changed world. In the midst of this disaster they still have the courage to realize that not all the changes were bad. They all stressed their "awakening", their awareness of the situation and their determination to fight through modern, cohesive women's groups. They see desertification control in terms of survival for themselves and their children and as a means of stemming the losses of cattle, water and land or bringing them back to the village.

In view of the severe constraints under which they labour in the performance of their domestic and agricultural tasks, the very fact that they have remained on land abandoned by heads of family should make them privileged partners in that fight.

It must be said that the desertification control policies still do not give women their due. Their role is considered secondary and most of the measures taken do nothing to further their advancement. Despite their participation in large numbers in various projects they are not recognized as the major protagonists in the struggle. Most of the time their capacity for work is exploited and they are asked to perform the hardest and most menial tasks. These projects are sometimes detrimental to their health and to the health of their infants, and are carried out at the expense of other less tiring and income-generating activities. These desertification control activities bring into sharp focus the land ownership problem for women - their entitlement to reclaimed land and planted trees, and to compensation for their additional work in soil restoration. Too narrow a sectoral approach has failed to meet women's needs for a lighter work-load, support for handicrafts and business activities, and information and training.

Their participation is usually voluntary and they rarely derive any benefit from it. Large-scale food aid in the form of "food for work" has in some cases fostered an exodus of the men and transformed the sites of the desertification control campaign into gigantic low-wage hiring halls where women make up the overwhelming majority of the labourers. What does "voluntary participation" in soil restoration mean in those circumstances?

Moreover, the approaches of the projects or of the NGOs rarely assert the social and economic advancement of women as a desired objective and almost never their participation in combating desertification as a preferred means of achieving it. The inadequacy of the means used for that purpose is obvious, as is the weakness of the management training for women required for progress in that area.

This harsh assessment must be qualified, however, by a number of positive factors that hold promise of a favourable development of the situation if the above-mentioned errors are corrected.

Positive, albeit recent, experiences now in progress in the Sahel have succeeded in fostering the social and economic advancement of women through desertification control activities designed as part of rural development.

Women interact with the plant world in many complex ways that must be well understood if the aim is to manage to involve them in forestry work. Women perceive trees primarily as a source of nourishment and healing and only afterwards as a source of wood. A knowledge of their lore and their needs is therefore a prerequisite. Foresters must learn to work with women, because their objectives are basically the same: to utilize the products of the tree and restore the plant cover in order to preserve the environment and satisfy the needs of the population. Women should be encouraged to become foresters of a more self-directed kind, like the "rural women foresters" of the Wood (for Villages) project in Kaya.

Management of a field or an orchard by a women's group gives women collective access to the land. Women are becoming increasingly involved in information and training activities and more heavily represented at decision-making levels. Some women, particularly in Burkina Faso, are beginning to install anti-erosion devices

in their fields and have even formed women's work teams that, for a modest wage, build little dikes in their neighbours' fields. Co-operatives are starting to accept women and sometimes to allow them credit for the purchase of agricultural materials: a local association in Burkina Faso, "Vive le Paysan", is a fine example of this. Women are also taking part in post-production support activities like food processing and crop marketing.

An assessment of the 10 most successful experiences shows that the approach to the problem, the philosophy underlying attitudes towards the advancement of women, and the translation of those views into action are decisive. The existence of a "women's component", while it is not a cure-all, is at least a recognition that certain problems are specific to women. The recruitment of a sufficient number of women in management positions is a major key to the success of activities involving women. It is indispensable to support the organizing of women - in associations or co-operatives: not only can an activity be built essentially around an organized and dynamic women's group, but the activity involving the women's group can also be a catalyst: leaders are not made unless they are given leadership responsibilities. The most successful experiences were those in which full confidence was placed in women; they show that women can be used in desertification control activities in other ways than by exploiting their capacity to work, and that activities in which they participate can and must further their social and economic advancement.

It is urgent to implement a truly national policy for the advancement of women through action plans developed in collaboration with women's organizations. It is important to think about what the Sahelian rural woman will be like on the eve of the year 2000. Today, women are caught in a major contradiction: they are both the guardians of social and cultural traditions in societies in the throes of destabilization, and the targets of new demands relating to agricultural production and desertification control. Women cannot be asked to be more competent and more responsible while they are the victims of discrimination: the options must be clear and must be expressed in institutional and legal measures such as the Family Code, the Rural Code, the Labour Code and population policies. That would spare everyone, including women, from voicing the same pious hopes that have been echoed for the past 15 years. The advancement of women is often the butt of sarcasm: yet, now that it has become "fashionable", it has become obsolete even before leaving the designers' drawing boards. Will it ever reach the ready-to-wear stage?

APPROACHES TO SELF-FINANCING

Ruth Engo-Tjéga

Water has to be constantly available because it is essential to health, saves time and enhances productivity, and it has been demonstrated that in this period of economic crisis, projects tending to rely solely on financial and technical aid from the central government or from foreign donors are more likely to fail than those that rely on local creativity and through that creativity and dynamism discover strategies leading to full accountability for costs, in other words, self-financing.

An important factor related both to self-financing and to the economic crisis is the danger that women may once again be the ones to suffer from the disengagement of the State. Consequently, water-related projects should increasingly be planned as community development projects and not women's rights projects.

There can be genuine self-financing through the marketing of crops grown on small irrigated plots and of livestock and through the transportation of product. One of the important factors in the self-financing process is the need to sustain the enthusiasm of the local communities and to keep a sharp eye on costs to prevent them from going up faster than user capacity to make a profit.

In addition, the management committees will have to learn from the outset to manage funds scrupulously as a hedge against unforeseen expenses. They should be encouraged to divide revenues three ways, according to percentages fixed voluntarily by the users:

(1) One portion for maintenance and renewal of equipment,

(2) One portion for technical staff salaries,

(3) One portion for a revolving fund.

The revolving fund can prove useful in a village that, having doubled its food production, finds itself badly overstocked because the local market is saturated. In such circumstances, a revolving fund can be drawn upon to finance the purchase of a transport vehicle, which not only opens up new markets but yields interest that strengthens the management committee's financial capacity and ensures the continued functioning of the water points.

TECHNOLOGICAL APPROACHES: THE CONCERNS OF THE TECHNICAL EXPERTS

(SELECTION OF SITES AND TECHNOLOGIES: PRESENT AND FUTURE NEEDS)

Sheik T. Tandia (Department of Public Health and Sanitation (DNHPA))

Souleymane Dembélé (Department of Water and Energy) (DNHE))

Between 1970 and 1978, the per capita investment in drinking-water supply was estimated to be between 18 and 20 US dollars in the urban areas, and not even 5 dollars for village water systems.

More than 2 billion people live in the developing countries, 70 per cent of them in rural areas. The percentage is over 90 per cent in sub-Saharan Africa. This indicates the extent to which the programmes of the Decade must focus on the rural world.

After the rural areas come the so-called peripheral neighbourhoods, made up of shanty-towns thrown together pêle-mêle by marginal groups that came in from the countryside in search of jobs.

These amorphous neighbourhoods are neglected by the planners of drinking-water and sanitation systems. Granted, it is not possible to set up drinking-water systems in apportioned areas and it is not much use to install sewers in neighbourhoods that have no running water. Urban planning guidelines must therefore be established as a prerequisite for a good urban sanitation system and should be a regular component of the Decade's programmes.

The developing countries that endorsed the Mar del Plata Action Plan fall into three groups:

(1) The first group includes countries that have relatively good absorptive capacity and programming infrastructure where financing is their principal constraint. This is the case, for instance, in most South American and South-East Asian countries.

(2) The countries in the second group have sufficient financial resources but are held back by poor planning. This category includes certain oil-producing countries in Africa and the Middle East.

(3) The countries in the third group, the largest, are faced with both inadequate planning structures and a shortage of capital. The poorest countries of the world fall into this third category. They deserve much more substantial international support to help them achieve the objectives of the Decade. The Republic of Mali is in this last category.

At the country level, the United Nations system provides support as follows:

(1) WHO has at its command, at the country level, a world-wide network of sanitary engineers and technical personnel. Field activities are complemented and supported at the Geneva headquarters by a team of very high-level officials.

(2) UNICEF employs 100 or so experts in the field, who are involved in sectoral projects.

(3) The United Nations has about 30 professional staff in the field, who are specialists in water resources development.

(4) UNESCO participates in research on water.

(5) UNDP organizes activities covering all aspects of the sector: research and development of ground water, sanitation, training of management personnel, and so on.

In each country, moreover, the UNDP Resident Representative is the focal point for external inputs. He is assisted in his task by a technical support team which he heads. This team's role is to advise the country's water committee.

APPROACHES FOR IMPROVING THE QUALITY OF HOUSEHOLD WATER AND HEALTH

Yolande Badre (Lebanon)

Many precautions must be taken to safeguard water quality:

1. Contamination from animal droppings must be avoided by having fences installed around the springs and noria-type wells to keep livestock (cattle, sheep, goats, etc.) out.

2. Sewer systems must be watertight and have to be maintained in order to avoid seepages that might pollute the piped water supply.

3. Sewage collectors must not be emptied out into natural pits, because as the sewage water infiltrates the permeable strata it reaches the groundwater horizons and pollutes the water. An example is the Fawwar springs at Antilyas (in the suburbs of Beirut) which used to supply drinking water for thousands of inhabitants and irrigate the orange groves and vegetable fields. After 1981, these initially clean waters were progressively contaminated by sewage water that infiltrated the sandy terrain. The springs were ultimately abandoned by the Beirut Water Department (the official body that manages the capital's water).

4. Garbage and waste must be disposed of not just anywhere but in impermeable ground in order to avoid polluting ground water by infiltration. In highly developed countries like Germany, waste is sorted into two categories:

(a) Non-biodegradable waste, such as glass fragments and the like, which are sold for recycling;

(b) Biodegradable waste, which is treated by fermentation in watertight pits.

CONTRIBUTION OF THE MINISTRY OF PLANNING AND CO-OPERATION - DEPARTMENT OF INVESTMENT PROGRAMMING, FINANCING AND FOLLOW-UP

Ndeye Coumba Guissé Dramé (Senegal)

In the countries of the Sahel, and Senegal in particular, the problem of water is acute. The drought of the last 20 years has led to desertification and resulted in a water shortage perpetuated by insufficient rainfall and the constant drying up of water points.

The consequences have been severe degradation of the soil, a breakdown of the ecological balance, etc. ...

The rural areas have been hard hit by this situation and it has particularly affected the women, as the main users and purveyors of water. The rural population is trying to cope by exploiting the scarce water resources in order to satisfy such vital needs as:

(1) Water for the family,

(2) Water for livestock,

(3) Water for farms and vegetable crops.

Water management, having been recognized as a priority, the State, the people, non-governmental organizations and donors are trying to set up projects, large and small, in order to improve the living conditions of the rural population and enable them to generate additional income.

The various approaches applied attempted to show that income-generating activities depend on water supply and on the fact that women can benefit from new opportunities created by the development of water resources.

Consequently, if the goals dependent on water management are to be fully realized, there must be, in addition to what has already been done:

(1) Better co-ordination of the machinery for management training and technical and financial support for the rural sector for the benefit of women in particular;

(2) Better organization of the system for placing products resulting from women's activity (market studies, food preservation, etc.);

(3) An expanded and strengthened water supply system, with women involved in its maintenance;

(4) Training of women with a view to good water management;

(5) Involvement of women at all phases of projects, from conception to execution;

(6) Assessment of the impact of water projects on the women themselves in order to point the way to strategies that will effectively lead to greater economic independence for women.

THE ROLE OF RWANDESE WOMEN IN THE MANAGEMENT OF WATER SUPPLY INFRASTRUCTURES

Vérène Mukandekézi (Rwanda)

The system for managing rural water-supply infrastructures is based on active participation by the people who benefit from it and on the community's duty under the law to ensure proper management of its water resources and, by the same token, to educate the users.

The users establish community trusts (régie associative) to manage the community water resources along the following lines:

(1) All the users of a water point join a users' association, which elects a small group of three or four people to a Water Point Committee, their task being, respectively, to keep the water point clean, collect members' fees and represent the users in higher bodies.

(2) In turn, the representatives of the community's water points form a committee called the Community Trust Committee, whose task is to organize all activities relating to the management of the community water-supply infrastructures.

(3) That Committee elects officers referred to as the Bureau, composed of three members: a chairman, his deputy and a treasurer. The Bureau is responsible for conducting the daily activities of the trust.

Already, in communities that have set up more-or-less operational users' associations and/or where community trusts are starting up, it is encouraging to find that Rwandese women are more heavily represented than in some other activity sectors. The table that follows indicates the percentage of women represented in

the water management committees for an inter-village water-supply system comprising 50 water points and providing water to the population of two villages (Muhura and Murambi) in the southwestern part of the country.

Task	Percentage of women represented	
	Village of Muhura	Village of Murambi
Responsibility for water point	46%	33%
Fee collectors	23%	39%
Responsibility for cleanliness around the water point	0%	0%

In the same two villages, the Bureau includes one woman serving as deputy to the chairman and also as secretary.

THE CUSO-TOGO VILLAGE WATER SUPPLY PROJECT (VWP) AND THE INCOME-GENERATING MICRO-PROJECTS

Ikpindi Zoumaro (Cuso-Togo)

The micro-projects, as originally designed, were short-term, low-cost activities at the village level designed to resolve the health problems of the villagers and find remunerative activities for them such as the farming of community plots, livestock projects, and so on. The tables below show that the sale on the local market of products from the first crop year under the income-generating micro-projects brought in from 2 to 10 times more than the amount needed to maintain the waterworks.

Following this success, a five-week training period was organized in 1987 for the village development committees involved in income-generating micro-projects. During the long rainy season in 1988, from March to July, 88 villages undertook these projects, some of them for the third time, again with good results. There are several reasons why these first three crop years were great successes:

(1) The villages did not actually have enough income to maintain the pumps and catchments that have recently been installed.

(2) The micro-projects represent a first major accomplishment by the villagers that shows their willingness to operate the waterworks.

(3) The income-generating micro-projects are a practical first step in a community development process whose scope goes beyond the mere maintenance of waterworks.

RESULTS OBTAINED IN 17 VILLAGES THAT PARTICIPATED IN THE FIRST CROP YEAR OF THE INCOME-GENERATING MICRO-PROJECTS (APRIL-JULY 1986)

TEAM		VILLAGE	AREA	DATE OF SOWING	WEEDING	APPLICATION OF FERTILIZER	TOTAL VWP INVESTMENT	PROFITS MADE
A.	1	AVEDJI	3/4 hectare	20 April	20 May and 19 June	Late May	21 000 CFA francs	80 000 CFA francs
B.	2	GATI-AKPAFO	1/2 hectare	12 April	5 May and 12 June	3 May	16 000 CFA francs	50 000 CFA francs
C.	3	AGAMAHE	1 hectare	13 April	Mid-May	Mid-May	24 000 CFA francs	150 000 CFA francs
	4	GAMEBLE	1 3/4 hectares	20 May		Not done	25 000 CFA francs	Total failure
	5	KPEVEGO	0.8 hectare	21 April	20 May	Late May	20 000 CFA francs	15 000 CFA francs
	6	BEGBE	1 3/4 hectares	23 April	25 May	Late May	25 000 CFA francs	200 000 CFA francs
	7	TONOUMASSE	1 1/4 hectares	22 March	Late May	Late May	30 000 CFA francs	125 000 CFA francs
	8	AGBO-DJOGBO	2 hectares	Late April	Late May	Late May	-----	200 000 CFA francs
D.	9	ATIDE	1 hectare	10 April	Twice late May	Not done	15 000 CFA francs	60 000 CFA francs
	10	AGBA-DJAGBE	0.8 hectare	Late April	Late May	Not done	-----	50 000 CFA francs
	11	TCHINGOUE	0.6 hectare	Late April	Late May	Not done	-----	40 000 CFA francs
E.	12	TOVE	1/2 hectare	15 and 17 April	22 and 29 May	No fertilizer	7 000 CFA francs	125 000 CFA francs
	13	ATSI-APETOKOIN	2 1/2 hectares	16 and 21 April	16 May	No fertilizer	20 000 CFA francs	625 000 CFA francs
F.	14	DATIVO	1/2 hectare	17 April	28 May	4 June	30 000 CFA francs	125 000 CFA francs
	15	KLOUMEKPOUE	1/2 hectare	17 April	15 May and 12 June	12 June	30 000 CFA francs	125 000 CFA francs
	16	AKI	1/2 hectare	25 April	22 May and 24 June	23 April	26 000 CFA francs	120 000 CFA francs
	17	NIAMESSIVA	3/4 hectare	22 April	20 May	No fertilizer	10 000 CFA francs	160 000 CFA francs
		TOTAL	17.45 hectares				299 000 CFA francs	2 255 000 CFA francs

THE SANITATION COMMITTEES AND THE ROLE OF WOMEN

Lisa Nichols (CARE-Mali)

The experience acquired from the Macina village water project and the Macina infant health-care project suggests the following conclusions:

(1) Participation by women in projects is indispensable if the desired changes are to take place;

(2) Women community workers are more effective in integrating women in projects;

(3) Health education must be an integral part of a global approach rather than an isolated activity.

ORGANIZATION AND TYPE OF PARTICIPATION BY WOMEN IN THE COMMUNITY

Kadidia Bangoura Maiga (National Department of Training and Rural Community Development - DNFAR) (Mali)

The case of Sougoula (600 inhabitants) in Mali, which has four boreholes, one of which is used to irrigate gardens from a storage tank, is an example of the interest women take in this kind of income-generating work, sustained by targeted and flexible promotion, advisory services and follow-up action.

THE ROLE OF AFRICAN WOMEN IN THE DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES

Olga Daguia (Benin)

It is indispensable to listen to women and include them in any consideration of rural water problems. If they are given the necessary training, women will be effective in assuming major responsibility for organizing the management of water points. This can only be achieved by a scientific approach to the problem of water supply. The computer used by the Water Department of Benin, PROSPER, ensures follow-up of all ongoing projects (comparison, progress, forecasting) and provides support for the programming of water projects.

STRUCTURE AND TYPE OF PARTICIPATION BY WOMEN AND THE COMMUNITY

Saklah Djimadoumngar Mbaitoubam (Chad)

The status of women, who represent the driving force of rural community life, has become a major and constant source of concern to those communities because women, more than others, have suffered the ravages of natural disasters and war. The weakening of family ties and traditional solidarity has forced women to take on their own shoulders the burdens once shared by the entire community. Traditional resistance to the introduction of new technology has broken down. Communities are more inclined to tolerate women's self-help organizations.

WOMEN'S ROLE IN CIDA PROJECTS

Krystyna Dunska (Canadian International Development Agency (CIDA))
Agence canadienne pour le développement international (Canada)

The key mechanisms the Agency has set up to ensure that women in recipient countries are integrated in development programmes include:

(1) The formation of a Committee for the integration of women in development in which representatives of all CIDA divisions participate. This Committee monitors projects, makes progress reports and submits recommendations.

(2) The launching in 1986 of a training programme which serves to brief all CIDA staff on questions relating to the integration of women in development. The main objective is to provide a practical methodology for the application of this concept.

We can already point to some achievements:

(1) An increase in the number of women from developing countries participating in training programmes and receiving training fellowships. In bilateral programmes, participation by women went from 17 per cent in 1985 to 23 per cent in 1987. The goal is to equalize the number of men and women trainees and fellowship-holders.

(2) A compilation of data on third world women and the development of methodologies to improve approaches by gathering gender-specific statistics. To that end, country profiles (comparing the situation of men and women to measure the level of participation by women) have been drawn up by most area bureaus on the countries in which they operate. Based on the profiles, a strategy is or will be developed to ensure the integration of women in programming for that country.

(3) Among the projects financed by CIDA in West Africa, a number of small projects being executed by non-governmental organizations (NGOs) with the help of villagers and the "micro-projects" are specifically geared to women.

MEASURES TO BE TAKEN TO ENSURE ADEQUATE DRINKING WATER SUPPLY AND SANITATION

Kodjo L. Ativon (Inter-African Committee on Water Studies)
(Comité Interafricain d'études hydrauliques (CIEH))

The success of a project is measured not by the number of pieces of equipment provided to users, but rather by how satisfied they are over a fairly long period of time. Success can therefore be measured only in terms of the operating efficiency and durability of the equipment installed. What happens once the project is completed is what counts.

While many activities have been carried out within the framework of the International Drinking Water Supply and Sanitation Decade, not all objectives have been fully met. The efforts exerted on all fronts must be sustained and even

strengthened. That presupposes that each participant will play his or her role fully, i.e.:

(1) That the user populations themselves will begin to realize the problems facing them and agree to get together to solve them;

(2) That States will launch sensitization campaigns and provide training and assistance of every kind (technical, financial, managerial and, where necessary, arbitral);

(3) That international organizations (intergovernmental and non-governmental) will provide assistance and strengthen their useful contribution.

CIEH, a technical organization, contributes to those efforts by conducting activities through technical staff from the government services - its number one target. These activities may be categorized as follows:

(1) Studies of methodological or regional interest, including:

(a) The village water point (three-volume work published in 1984),

(b) The study of drainage systems (made over a number of years and periodically updated),

(c) Specifications for the provision, installation and maintenance of hand pumps,

(d) The general design of urban sanitation systems in the African context (five-volume work published in 1984 and 1985),

(e) Study of public toilets (published in 1986).

(2) The organization of technical and training meetings, including:

(a) The International Seminar on Sanitation in Africa (organized at Niamey in May 1985),

(b) The International Workshop on the Development of Low-cost Drinking Water and Sanitation Technologies (held at Ouagadougou in May 1987),

(c) Workshop No. 2 of the CIEH Technical Days (at Ouagadougou in February 1988) on drainage systems,

(d) The establishment of the Regional Centre for the Development of Low-cost Drinking Water and Sanitation Technologies (CREPA),

(3) Access to our reference centre, the largest in Africa on water and sanitation, by all users,

(4) Technical support which CIEH provides to the technical services of its 13 member States, at their request.

COMMUNICATION FROM AFOTEC

Rokiatou Tall (Service international d'appui à la formation et aux technologies en Afrique de l'Ouest, Sahel (AFOTEC))

(International Service for Support to Training and Technology in West Africa, Sahel)

Women are at the heart of development, considering the multiple roles they play in communities, particularly in the area of water and sanitation, which is their responsibility. Consequently, integrating women in all water and sanitation activities is simply a matter of common sense and of concern for efficiency.

This explains the AFOTEC approach; while it places women in the forefront of water and sanitation activities, it also involves men out of concern for the harmonious development of the community.

Indeed, it is now firmly established that in order to meet water and sanitation challenges in our communities, we must use our local potential to the fullest and, at the same time, be open to new technologies. AFOTEC develops and encourages the use of local technologies with the participation of the users themselves. This approach captures the spirit of the remark made by the Sahelian farmer who said: "You see? We want to save our skins by our own efforts!"

SUMMARY OF AFOTEC ACTIVITIES FOR WOMEN IN ITS WATER-SANITATION PROJECT

Activities	Year	Groups	Trained in:	No. of participants
Training of well-diggers	1985	EN	Senegal	7
Training of well-diggers	1987	APS	Senegal	3
Training of well-diggers	1987	AJAC	Senegal	9
Manufacture of "Malian" hand pump	1984	ED	Mali	20
Manufacture of "Malian" hand pump	1985	AJAC	Senegal	24
Refresher training and manufacture of the "Malian" hand pump	1985	ED	Senegal	20
	1985	AJAC	Senegal	24
	1986	AJAC	Senegal	24
	1987	ED	Senegal	20
	1988	AJAC	Senegal	24
	1988	ED	Senegal	20
Manufacture of upgraded copings and covers	1988	ED	Senegal	20
	1988	AJAC	Senegal	24
	1988	TESSITO	Senegal	3

Activities	Year	Groups	Trained in:	No. of participants
Testing of upgraded piston	1988	AJAC	Senegal	24
	1988	ED	Senegal	20
	1988	ARM	Mali	19
Pottery (manufacture of water jugs with spouts)	1988	AJAC	Senegal	19
	1988	ED	Senegal	22
Hygiene - water training	1988	AJAC	Senegal	84
	1988	ED	Senegal	44
Training in latrine construction	1988	APS	Senegal	50
	1988	EMH	Senegal	4
Manufacture of scrub basins	1988	AJAC	Senegal	1
	1988	ED	Senegal	1
	1988	APS	Senegal	1

WATER IN CAPE VERDE

Rosa M. Pinheiro (Cape Verde)

Since water is scarce in Cape Verde, water resources all over the country have been declared public property belonging to all the people.

The water shortage has led to caution in the use of ground water, the desalination of seawater and a more rational utilization of water in general, accompanied by user fees which discourage waste but still guarantee universal access to water.

REPORT OF THE ACTIVITIES OF THE NATIONAL UNION OF DJIBOUTIAN WOMEN (UNION NATIONALE DES FEMMES DJIBOUTIENNES (UNFD))

Saada Mohamed (Djibouti)

In an arid country, like the Republic of Djibouti, which has no permanent watercourse, the full importance of water management and the role of Djiboutian women in that activity are self-evident. Aware of this problem, UNFD has established a health committee to launch a public awareness campaign on the problems of managing available water and, especially, hygiene.

UNFD is issuing an appeal to international organizations at both the material and financial levels, for:

(1) better sanitation,

(2) a better supply of running water to the disadvantaged,

(3) provision of water storage equipment,

(4) establishment of protected well-water zones,

(5) installation of drilling equipment or the digging of wells in the remote areas of the country,

(6) a more efficient system for women water-carriers.

WATER RESOURCES DEVELOPMENT

MICRO-PROJECTS PROGRAMME (PMR)

Adélaïde Sare (International Co-operation Studies Centre) (Centre canadien d'étude et de coopération internationale (ICSC)) (Canada)

PMR APPROACHES TO WATER MANAGEMENT: WELL-DRILLING, CASE OF KUNDULA

Kundula is a village situated on the Mossi plateau. For administrative purposes, it is in the department of Guibaré in the province of Bam. Located approximately 100 kilometres north of Ouagadougou, Kundula is in the hot, dry Sudano-Sahelian climate zone. Average annual rainfail ranges between 500 and 600 mm. According to the 1985 census, it had a population of 4,800.

Kundula was involved in PMR as part of a socio-economic development project and at the request of the people of the village.

Drilling equipment was installed in Kundula, which has four main districts, in response to the acute water problem in the village. This lack of water, combined with insufficient agricultural production, not only was making life unbearable in a village that was dying out, but was also driving the inhabitants out in large numbers.

In order to ensure the continued operation of the newly acquired drills, the community had to be made responsible. The micro-projects programme has carried out the following activities in collaboration with government institutions:

(1) Maintenance of water points

At every stage of its involvement, PMR places special emphasis on the training of users with the aim of encouraging self-management of the installations.

Repairmen received an initial 10 days of training at the Sainte Famille centre and were then given a tool-kit at an affordable cost. The equipment was to be used in maintaining and repairing the pumps.

In the event of a breakdown which cannot be repaired in the village, repairmen can call on technicians from the Sainte Famille technical centre for help. The people are encouraged to make an effort to use the pump properly and keep the water points clean. Women are put in charge and their job is to sensitize the whole village and see that standards of cleanliness are observed.

(2) Management Committee

The Management Committee is composed of 17 members elected by the people at a general meeting.

It has the following duties:

(a) To maintain and repair the pump,

(b) To keep the areas around the water points clean,

(c) To instruct drill users,

(d) To co-ordinate drilling activities,

(e) To collect fees,

(f) To collect funds and make disbursements,

(g) To control funds.

Fees are paid monthly by heads of household. However, very often, women contribute regularly to the payment of these fees.

In a census of village heads of households taken by the group leaders and the leaders of the Revolutionary Committees (CR), 273 households were counted.

The fees (rates) have been fixed by the population, as follows:

(a) Household water supply: 150 francs/month/head of family,

(b) Water for large-scale livestock breeding: 500 francs/month/head of family,

(c) Water supply for small livestock farmers: 50 francs/person/month,

(d) Water supply for nomadic livestock farmers (one day): 150 francs/watering; when he stays more than four days, he pays 500 francs.

They are collected by rate collectors who then pay the monthly fees over to the general treasurer. These funds are used to purchase spare parts and to make the necessary pump repairs.

Under the system of management, users who are delinquent in their payments are identified and the Management Committee makes its report to the general meeting. At that time, the importance of making timely payments can be impressed upon delinquents. This method has often yielded results.

PRESENTATION BY THE REPUBLIC OF GUINEA BISSAU

Marcelina Dos Santos (Guinea Bissau)

Priority activities planned in the water/sanitation sector for 1987-1991

In order to attain the desired goals, the departments of water resources and public health have accorded priority to the following activities:

(1) Training of national senior staff in the management of water resources, primary health care and other technical areas;

(2) Training of national technical staff necessary to ensure the regular operation of each activity in the sector;

(3) Health education in the schools, with a water/sanitation component, chiefly at the primary and secondary levels;

(4) Health education at health centres, sector hospitals, and in grass-roots organizations and projects in an effort to motivate the population to make proper and controlled use of water points and latrines;

(5) Widest possible dissemination of techniques in the building of latrines, kitchen ranges and water filters, using local materials and local labour;

(6) Collection, processing and analysis of all the hydrological and hydrogeological research data gathered in the country;

(7) Installation of a water quality control system based on periodic and systematic physical and bacteriological analyses of the water from all water points and other water supply systems;

(8) Supply of the materials necessary for the population to build at least one sanitary latrine per family.

PRESENTATION BY MAURITANIA

Aissata Kane (Mauritania)

Water and sanitation pose many problems in our region, most notably problems of scarcity, lack of cleanliness, distribution and cost. Women have drawn the community's attention to these crucial problems urgently requiring solutions at the Arusha and Nairobi international conferences. The evaluation of the implementation of the Arusha and Nairobi strategies indicates that much remains to be done.

PRESENTATION BY THE DEMOCRATIC UNION OF CENTRAL AFRICAN WOMEN
(UNION DEMOCRATIQUE DES FEMMES CENTRAFRICAINES (UDFC))

Claude Zarambaud

It is becoming increasingly difficult to supply water to populations in the dry season. The prefecture of Ouham, especially its northern part, is being hit full force by the encroachment of the Sahelian desert. Every year, a growing number of watercourses dry up, compelling women to fetch water from 1 to 5 kilometres away. The women use up much energy to get a little water. Moreover, the village backwaters are always infected because most of the time they are being contaminated by the runoff, causing such water-borne diseases as bilharziasis and hookworm and carrying a number of parasites.

KASSERINE PILOT PROJECT

RURAL DRINKING WATER USERS' ASSOCIATION

Fatma Nachi (Tunisia)

(1) General objective

As part of a participatory approach to development and health programmes, the Central Tunisian Development Office (ODTC) has developed a multidisciplinary programme aimed at setting up, maintaining and monitoring rural drinking water points.

The general objective of this community association is to reduce the incidence and prevalence of water-borne diseases in the region by directly involving the community in the maintenance of wells, water treatment and the detection of water-related diseases in the area of wells. The community is represented by the Drinking Water Users' Association.

(2) Main activities of the health team

In this project, the health team is involved in essentially two types of activities:

(a) Technical activities consisting of:

- Supervising the installation of water-points in accordance with health standards;

- Continuous monitoring of water cleanliness by providing each association with a chlorine residual and bleach measure for purposes of disinfection, if necessary, and in accordance with standards;

- Regular periodic sampling of water for bacteriological and physical and chemical analysis in order to test whether it is suitable for drinking.

(b) Educational activities aimed at:

- Motivating and sensitizing citizens to generate participation in the repair, maintenance, monitoring and treatment of wells;

- Teaching citizens to respect and apply rules of hygiene and to look after their health.

WATER - A GUARANTEED SOURCE OF INCOME FOR WORKING WOMEN

Ibrahima Séméga (OMAES) (Mali)

All around the village of Thial, over an area of approximately 13 hectares, men have dug more than 90 traditional wells for their women.

Since the amount of water contained in a well is not always adequate for watering a market garden and the means used to water the vegetable beds are not very reliable, the women have built small cisterns close to the wells in which they carefully conserve water.

Between the cistern and the well, each woman has dug a small canal 16 centimetres wide and 14 centimetres deep. The length of the canal varies between 10 and 12 metres depending on the size of the garden plot. Each woman carefully piles straw up to the edge of the cistern. The straw, which lines the canal, prevents the earth from absorbing the water, which has to flow into the cistern. The cistern is not lined with cement but is plastered with a mixture of straw and cow dung kneaded with clay. This mixture protects the cistern and retains the water for the longest time possible.

This solution has been chosen not only for economic reasons, but as a precaution. The water from the cistern is used judiciously and the women see to it that not a single drop falls on the walks between the vegetable beds because if they get wet the women could slip and fall.

In addition, some women prefer that their children draw water from the cistern rather than the well. Experience has shown that some children are so inept at drawing water that they cause the well to deteriorate rapidly. Since the well is a guaranteed source of revenue for every household, women want to minimize that risk. The fact is that intensive but highly profitable market gardening sustains the household.

After each woman has her well, the village co-operative, which is actually a store selling the main consumer products and other essential goods, distributes seeds - on a credit basis - to the women with market gardens, including seeds for onions, tobacco, peppers, squash, tomatoes, mint, etc.

As soon as they get their seeds, the women start to work. They set up plant nurseries, fertilize the vegetable beds with dung, do the planting and, with the help of their children, water the vegetables. They use gourds, earthenware jugs, pails and well buckets - simple implements which make them rich. In harvesting the vegetables they have planted, they are careful to select seeds to be saved for future use.

The sale of vegetables enables the women to pay what they owe the village co-operative. After the successful project it completed in the village of Thial, OMAES decided to assist women in other villages in the Ténenkaou district. Onion production is estimated at 2,000 sacks per crop year.

HUMAN PROBLEMS OF RURAL POPULATIONS IN GENERAL AND RURAL WOMEN IN PARTICULAR CAUSED BY DROUGHT

Fatou Diop (Mauritania)

Drought creates the following problems for the rural population of Mauritania:

1. Water problems

The persistent drought has lowered and in some cases dried up several ground-water aquifers. Surface ground water directly supplied by rainfall has been most severely affected. Rural populations have had to deepen their wells in order to reach water. For example, at Touela (Trarza) water could be drawn at a depth of 5 metres in 1972; one year later, the nomads had to make the same well 3 metres deeper.

2. Agricultural problems

There is an enormous grain deficit in all regions. Average yields are not large enough to establish food self-sufficiency. Mauritania produces only 100,000 tons while the country's needs are estimated at 200,000 tons.

3. Livestock problems

Animal losses were higher than 10 per cent in every region of Mauritania. In some cases, they are almost 50 per cent (Assaba, 46 per cent). In other cases, they are even higher (Nouakchott, 50 per cent and Gorgol, 60 per cent).

4. Food problems

Closely linked to agriculture and livestock farming, the diet of rural populations has undergone an abrupt and radical change: fresh milk, meat and millet have been replaced by imported grains. The changes in eating habits have had a negative impact on the health of rural populations.

5. Health problems

Without an adequate food supply, the most isolated rural populations have suffered severe malnutrition. As indicated in the following table, children have suffered most.

Table showing child malnutrition in rural zones in certain regions of Mauritania: Assaba, Brakna, Hodh el-Gharbi

Region	Number of children surveyed	Malnutrition	Serious malnutrition	Total
Assaba	157	30 per cent	13.4 per cent	43.4 per cent
Hodh el-Gharbi	620	34 per cent	7.5 per cent	41.5 per cent
Brakna	1 066	30.9 per cent	18.1 per cent	49 per cent

6. The rural exodus

Confronted with the difficulties highlighted above, people have drifted towards the towns in search of better living conditions (water, food and jobs). It should be noted, however, that the influx of these rural populations in Mauritanian towns is only the first step in their migration abroad.

The economically active males are increasingly leaving the villages in search of employment other than that offered by the farm family. This large male emigration has only increased women's family burdens.

They will find it difficult to cope with this situation: indeed, rural women today, as a population group, are getting nothing out of technical improvements and training, which tend to favour rural men. Although most are unaware, women are becoming conscious of the harshness of their existence and want to improve their output, income and living conditions. Their aspirations are expressed and manifested through pre-co-operative groups that they have formed or that were established at the instigation of the authorities.

PRESENTATION ON THE STATUS OF WOMEN AND CHILDREN DEPARTMENT - MADAGASCAR

Mino Lalao Andriamihajamanana (Madagascar)

The Status of Women and Children Department organizes programmes on the rational use of household water, their aim being to reduce water-related illness (skin diseases, diarrhoea etc.) and encourage personal hygiene and a sound diet.

These programmes are primarily aimed at women, who are the primary users of water and who are largely responsible for water chores. The strategy of mobilizing women for proper water utilization is an element in the implementation of integrated development projects in collaboration with the technical divisions concerned and non-governmental organizations.

The Water Code now under consideration has the following objectives:

1. To combine and summarize in a single document the main texts concerning the essential aspects of the use and protection of water resources in Madagascar;

2. To update earlier texts to reflect the current situation in Madagascar;

3. To settle fundamental water issues, including water rights and water management.

PROBLEMS RELATING TO THE USE OF WATER POINTS IN KITA COUNTY (PRINCIPAL REGION OF MALI)

Mariame Diawara Kebe

Department of Water and Energy (DNHE)

Kita County, an area of 35,250 square kilometres, has a population of 233,906 (as of 1987) living in eight districts and 308 villages. Until 1984, this region had enormous water problems, both quantitative and qualitative.

The local component of the Health Development Project (PDS) and the Rural Water Project (PAEPR) covers the counties of Kita and Bafoulabé in the main region (Kayes). These two projects are designed to improve the health of the people living in that region. To that end, 427 boreholes were drilled with the participation of the villages concerned, the Development Committee, the Parent's Association of Kita County Students and the Organization for the Integrated Development of Groundnut and Grain Productivity (ODIPAC).

These boreholes, supplementing the existing wide-diameter wells, have substantially increased the water resources of the villages and hamlets in these areas. Now that the water is available, it must be made drinkable and the other aspirations of the people must be met.

Recent observations indicate that the established water points and the existing village support structures are underutilized, but that there is serious interest in better utilization of those resources.

EXPERIENCE OF A VILLAGE WATER PROJECT IN THE MOUHOUN LOOP

Alidiato Dao (Burkina Faso)

The project zone covers three provinces: Kossi, Sourou and Mouhoun in the northwest region of Burkina Faso. A branch of the Department of Well-Drilling has been established at Dédougou, county seat of Mouhoun province. During the first phase (1981-1983) and the second phase (1983-1986), 758 water points were installed: 468 new wells, deepened traditional wells, and 290 boreholes with hand pumps. Currently, the project is in its third phase, during which 250 boreholes will be dug and 100 wells will be drilled although not officially authorized, and emphasis will be placed on repairing water points and seeing that they work properly.

In each village where a water point is installed, the villagers elect a water point committee. This committee is trained in the use and management of water points. When a borehole is made, two committee members are trained as mechanics. For this work, the village must pay 50,000 CFAF per year, divided as follows:

(1) 20,000 CFAF for pump maintenance and repairs,

(2) 30,000 CFAF for pump replacement.

The community participation section made an evaluation of the functioning of the water point committees in 100 villages, which showed that the committees are

only operating in half of the cases because many of the men (who represent a majority of the committee members) are leaving the village. Furthermore, men do not feel involved in water matters because water chores are essentially women's work.

This research, carried out with the participants in the project, led to the organization and establishment of water point committees composed solely of women. The idea of setting up women's water point committees is in keeping with national policy and is a working method which has already been applied in other fields (for example, mill management).

The fact is that the village women are by and large illiterate. Consequently, in order to be of more help to the committees the community participation section focused on training the women. This training, which is done in the language spoken by the women, is theoretical and practical. It is based on the following:

1. Committee activities,

2. Principles of management and accounting,

3. Mechanical skills (assembly and disassembly of pumps, detection of malfunctions),

4. Health education,

5. Environmental health.

STRUCTURE AND TYPE OF PARTICIPATION BY WOMEN AND THE COMMUNITY

Mélanie Surwavuba (Burundi)

Community participation is the active involvement of local populations in decisions concerning the elaboration or execution of development projects. Investment in human resources per se cannot be equated with community participation. It calls for passive acceptance of services and assistance in kind or in cash, whether it takes the form of contributing money for a purchase, digging a well of laying bricks for a health centre or a school. It is a way of obtaining cheap labour.

The dynamics of a changing society on the other hand demand much more than passive acceptance, compliance and unpaid labour. The new type of participation demands identification with the activity which is generated by participation in project design, planning, decision-making, execution and evaluation and which is based on a single objective - the socio-economic development of the community. The process is more psychological than physical.

The overall and principal objective of community participation is that the project should ultimately be taken over by all who benefit from it. And, as is the case with any ownership of property, motivation is needed along with the necessary resources to ensure that the project continues to meet the needs expressed by the community.

WOMEN'S ACTIVITIES RELATING TO WATER RESOURCES DEVELOPMENT IN THE SYRIAN ARAB REPUBLIC

Kossar Chahine (Syria)

In Syria women are in charge of all aspects of water management. They are trained not only to provide an adequate supply of water but also to use water in the interest of maintaining good health.

ADMINISTRATIVE AND FINANCIAL ROLE OF GOVERNMENTAL ORGANIZATIONS

Kadiatou N'Diaye Doumbia and Maimouna Dramé

Department of Water and Energy (DNHE) (Mali)

Water used to be free; however, there are now two ways of paying for it: the decentralized system (bills shared among households) or the centralized system (public funds) based on taxes (users' fees).

The main problems are the recovery of costs to defray maintenance expenses and the danger of a return to traditional sources when distribution costs go up. The decentralized system in rural areas is supported either by a special contribution from heads of family or by voluntary contributions from women. It is not possible to recover investment costs; efforts are limited to financing the maintenance of equipment.

At Ségou, the price of a bucket of water has dropped from 10 to 5 MF since the hiring of a supervisor who makes his rounds on bicycle.

COMMUNICATION FROM THE NATIONAL WOMEN'S UNION OF MALI (UNFM)

Kadia Togola Diakite (UNFM) (Mali)

The women who live in the harsh Sahelian regions must play a decisive role. If they did, in the near future they could take over from the NGOs which provide them with technical and financial assistance in setting up water supply and sanitation systems. Women continue to be the target group for good water management and the rational use of the systems.

AN APPROACH TO IMPROVING THE QUALITY OF HOUSEHOLD WATER AND HEALTH

O. Kalie Kankarti (Togo)

Recommendations

1. Recommendations directed to project leaders and water services officials:

(a) To involve women in all phases of the project: decision-making, implementation, and evaluation;

(b) To link the socio-sanitation aspect to all water supply programmes and strengthen the policy of training, information and education for rural women in sanitation and water management. This would reduce the incidence of water-related illnesses;

(c) To train a woman community leader to take charge of the promotion of women's activities in the water resources, hygiene and health sectors;

(d) To promote technologies designed to lighten the domestic work-load and organize leisure activities for women.

2. Recommendations directed to water services officials:

(a) To reduce as much as possible contamination of wells by animal waste by installing drainage systems at a depth of at least 15 metres;

(b) To guarantee the effectiveness of protection measures through regular analysis and monitoring of water;

(c) To eliminate well pollution occurring during pump maintenance and repair by regularly disinfecting all spare parts and to study the possibility of manufacturing pumps and spare parts locally in each country;

(d) To strengthen co-operation among all the services involved in questions of village water supply and socio-sanitation systems with a view to harmonizing their methods for the benefit of the users.

THE CASES OF MANITOU AND SOUGOULA (MALI)

Rossella Belli (Italy)

1. The case of Manitou

An analysis of the case of Manitou has led to the following conclusions: there is an urgent need to improve the food situation, especially in the dry season, and it is felt to be urgent by the populations which, when they have the chance, spend a great deal of energy in the cultivation of small market gardens. Since a large additional volume of water is necessary to satisfy the need, there should be a careful re-examination of the usual basis on which boreholes are allocated.

2. The case of Sougoula

Sougoula is a village of over 600 people, situated in the Ouelessebougou District (Kati County). The village has three boreholes, one of which is used exclusively for gardening.

In the past, the village was the site of development activities and benefited from the assistance of the Ouelessebougou Centre for the Education of Women as Rural Community Leaders (Centre pour l'éducation féminine à l'animation rurale (CEFAR)). In that context, a particularly active and motivated women's group was formed: 112 women participate in market gardening activities.

The vegetable gardens cover an area of more than 9,000 square metres. The water supply comes from an INDIA-model pump with an 80-mm pump body, providing an effective flow rate of 1,300 litres per hour. An 8 m^3 storage tank ensures a more rational use of the water. Dug out of the ground, the tank was constructed of parpens and cement at a low cost (50,000 CFAF). The villagers participated in the construction. A 28-m modern well supplies part of the water essential for the gardening activities.

A woman agricultural expert from the Organisation Haute Vallée (OHV) provides technical advice. The proximity of the county seat of Ouelessebougou (14 kilometres), which has an established market, is an incentive for marketing the produce.

The case of Sougoula represents the upper limit of the extension of market garden activities based on hand pumps in a geographically favourable situation and social context.

In conclusion, three observations are in order:

(a) Village women are involved in large numbers in market gardening activities. Specific training, advice and follow-up are important catalysts;

(b) A low-cost installation (at least a storage tank) is an essential condition for the rational use of water resources. Consequently, boreholes should be equipped with this minimum piece of equipment;

(c) In a more limited number of cases, in particular favourable conditions, market gardening activities can be expanded by using one borehole exclusively for that purpose.

COMMUNICATION FROM THE AUTONOMOUS METROPOLITAN DRINKING WATER PLANT - PORT AU PRINCE, HAITI

Mireille D. Daguilh (Haiti)

In Haiti, where considerable efforts have been made to diversify the drinking water supply and irrigation systems, women are involved at every level. They participate actively in the planning, research analysis, construction and maintenance of water supply systems. They also manage water use in the home and are thus directly involved in water conservation and water quality. In that way, they help to improve the living conditions and the health of the people.

Annex I

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Annex II

LIST OF UNITED NATIONS PUBLICATIONS ON WATER RESOURCES

Report of the United Nations Interregional Seminar on Flood Damage Prevention Measures and Management, Tbilisi (Union of Soviet Socialist Republics, 1969). Published under symbol ST/TAO/SER.C/144.

Integrated River Basin Development. Revised edition, 80 pp., two maps. Report by a Panel of Experts. In English (French and Spanish versions out of print). Sales No. 70.II.A.4.

Solar distillation as a means of meeting small-scale water demands. 86 pp., graphs and tables. In English (French version is out of print). Sales No. 70.II.B.1.

Triennial Report on Water Resources Development, 1968-1970, 202 pp. In English only. Sales No. 71.II.A.15.

Abstraction and use of water: a comparison of legal régimes. 254 pp. In Spanish and French (the English version is out of print). Sales No. 72.II.A.10.

Proceedings of the Interregional Seminar on Water Resources Administration, New Delhi, 1973. Published under symbol DP/UN/INT-70-371.

National systems of water administration. 183 pp., tables, annexes. In English only. Sales No. 74.II.A.10.

Ground water storage and artificial recharge. National Resources/Water Series No. 2, 270 pp., graphs, tables. In English, Spanish and French. Sales No. 74.II.A.11.

Management of international water resources: institutional and legal aspects. Natural Resources/Water Series No. 1, 271 pp., maps, tables, annexes. Report by a Panel of Experts. In English, Spanish and French. Sales No. 75.II.A.2.

The demand for water: procedures and methods for projecting water demands in the context of regional and national planning. National Resources/Water Series No. 3, 240 pp., tables, annexes. In English and Spanish (French version is out of print). Sales No. 76.II.A.1.

Ground water in the Western Hemisphere. Natural Resources/Water Series No. 4, 337 pp., tables, maps. In English, Spanish and French. Sales No. 76.II.A.5.

Guidelines for flood loss prevention and management in developing countries. Natural Resources/Water Series No. 5, 183 pp., tables, annexes. In English, Spanish and French. Sales No. 76.II.A.7.

Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977, 181 pp., annexes, in English and French (Spanish version is out of print). Sales No. 77.II.A.12.

A review of the United Nations ground water exploration and development programme in the developing countries, 1962-1977. Natural Resources/Water Series No. 7, 84 pp. In English, Spanish and French. Sales No. 79.II.A.4.

Efficiency and Distributional Equity in the Use and Treatment of Water: Guidelines for Pricing and Regulations. Natural Resources/Water Series No. 8, 175 pp., tables, annexes. (Spanish and French versions are out of print). Sales No. 80.II.A.11.

Water Resources Planning: Experience in a National and Regional Context. Report of a United Nations Workshop convened in co-operation with the Government of Italy. In English. Document published under symbol TCD/SEM.80/1.

Rural Water Supply. Report of a United Nations interregional Seminar convened in co-operation with the Government of Sweden at Uppsala (Sweden) from 6 to 17 October 1980. In English. Symbol: TCD/SEM.81.1.

Ground water in the eastern Mediterranean and western Asia. Natural Resources/Water Series No. 9, 230 pp., tables, charts. Sales No. 82.II.A.8.

Experiences in the development and management of international river and lake basins. Natural Resources/Water Series No. 10, 424 pp. Proceedings of the interregional meeting for international river organization held by the United Nations at Dakar (Senegal) from 5 to 14 May 1981. Sales No. 82.II.A.17.

Flood Damage Prevention and Control in China. Natural Resources/Water Series No. 11. Report of a Study Tour and Workshop in the People's Republic of China, 16-31 October 1980. Sales No. 82.II.A.13.

Ground water in the Pacific Region. Natural Resources/Water Series No. 12, 289 pp., tables, maps. Sales No. 83.II.A.12.

Technical Co-operation among Developing Countries in Ground Water Resources Development. Report of a United Nations international colloquium convened in co-operation with the Government of Yugoslavia at Zagreb from 23 to 28 May 1983. 123 pp., tables, annexes. In English only. Symbol: TCD/SEM.83/1.

Treaties concerning the utilization of international watercourses for purposes other than navigation. Natural Resources/Water Series No. 13, 98 pp. In English and French. Sales No. 84.II.A.7.

The Use of Non-conventional Water Resources in Developing Countries. Natural Resources/Water Series No. 14. Sales No. 84.II.A.14.

Ground water in continental Asia. Natural Resources/Water Series No. 15. Sales No. 86.II.A.2

Water Resources Legislation and Adminstration in Selected Caribbean Countries. Natural Resources/Water Series No. 16. Sales No. 86.II.H.2.

Institutional Issues in the Management of International River Basins: Financial and Contractual Considerations. Natural Resources/Water Series No. 17 (to be issued as a publication).

Application of Computer Technology for Water Resources Development and Management in Developing Countries. Symbol: TCD/WATER/1, 95 pp.

Ground water in North and West Africa. Natural Resources/Water Series No. 18. 415 pp. In English and French. Sales No. E.87.II.A.8.

Ground Water in Eastern, Central and Southern Africa. Natural Resources/Water Series No. 19. 341 pp. In English and French. Sales No. E.88.II.A.5.

Water resources planning to meet long-term demand: guidelines for developing countries. Natural Resources/Water Series No. 21. 117 pp. In English, French and Spanish. Sales No. E.88.II.A.17.

Non-conventional water resources use in developing countries: Proceedings of the Interregional Seminar, Willemstad, Curaçao, Netherlands Antilles, 22-28 April 1985. Natural Resources/Water Series No. 22, 505 pp. In English. Sales No. E.87.II.A.20.

Ground Water Economics. Report of a United Nations International Symposium and Workshop convened in co-operation with the Government of Spain. Barcelona, Spain, 19-23 October 1987. 65 pp. In English. Symbol: TCD/SEM.88/2.

Assessment of Multiple Objective Water Resources Projects: Approaches for Developing Countries. 125 pp. In English. United Nations/United Nations Environment Programme. Symbol: TCD/SEM.88/3.

Legal and institutional factors affecting the implementation of the International Drinking Water Supply and Sanitation Decade. Natural Resources/Water Series No. 23. 121 pp. In English, French and Spanish. Sales No. E.88.II.A.21.

Ground water development and management in developing countries: 25 years of United Nations activities, 1963-1988. In English, French and Spanish. Sales No. E.89.II.A.8