



# **Dry Taps ... Gender and Poverty in Water Resource Management**

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# TABLE OF CONTENTS

<b>I. The UN and other organizations</b>	<b>4</b>
The Millennium Development Goals	4
International Fora for Natural Resources: Water	5
Water Programmes	7
<b>II. Integration of Gender Concerns into Water Programmes</b>	<b>8</b>
Water Policy and Strategy: the Gender Issues	8
Water Projects and Water Management: Power and Powerlessness	9
The Gendered Nature of Water Use	10
Irrigated Agriculture	12
Rainfed Agriculture	16
Fisheries	17
Watershed Development	19
Beyond the Agricultural Sector	21
Domestic Water	22
Disaster Preparedness and Response	24
<b>III. Conclusions and Areas for Action</b>	<b>25</b>
<b>References</b>	<b>29</b>

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Water is a basic human need and a basic human right. In situations of scarcity, decisions about access to water and use of water involve actors at the intergovernmental, governmental, regional, community and household levels and often become highly politicized. The needs and perspectives of large and small scale farmers, of small and medium sized enterprises, of households, of fisherfolk and of others who earn their livelihood from water can differ significantly. At the same time, level of commitment of the different actors to conservation practices and to protection of water resources from contamination may also vary and the question of whose interests prevail and receive top priority can create considerable tension. The most vulnerable members of societies – the landless and the poor – often have no voice in decision-making about water and their needs may be given little priority. This paper reviews current practices in water utilization and management in developing countries, focusing specifically on the gendered nature of water decision-making.

Freshwater accounts for only 2.5 percent of the surface of the earth and more than half of all available freshwater is already being used (UNFPA 2002). Over the past decade, experts have given frequent warnings that the global supply of water is rapidly being depleted and that world consumption patterns must be reduced through more efficient and less wasteful water usage. The major disparities in water use among industrialized and developing countries have been calculated in dramatic terms (Box 2), underscoring the inequality of access to water resources, worldwide.

## Box 1: Access to Water

In the year 2000, there were still 16 countries in the world where less than 50 percent of the population had access to “improved water sources,” i.e. piped water, a public tap, a borehole with a pump, a protected well, a protected spring or rainwater. In numeric terms, approximately 1.2 billion people lack access to clean water (UNDP, **Human Development Index**, 2002).

## Box 2: Global Inequities in Water Use

In Africa, household water use averages 47 liters per person. In Asia, the average is 95 liters. In the United Kingdom, the average is 334 liters per person per day and in the United States the average is 578 liters per person per day. (UNFPA 2000)

Despite these major disparities in water use, the well-known negative effects of poor water and sanitation facilities on health, and the lack of access of the poor to basic social services in many developing countries, the response from international donors has been relatively low-key. Recent estimates suggest that US\$ 206-216 billion would be required annually to provide basic social services (primary education, basic health care and food, reproductive health, clean drinking water and sanitation) to developing countries (Martens 2001). At the end of the 1990s, governments, including those of developing countries, were spending about \$136 billion per year on social services, leaving a shortfall of \$70 – \$80 billion. Official development assistance stood at \$53.1 billion in

2000, but it is estimated that only about 11 percent of bilateral and multilateral funds were directed towards the provision of basic social services (Martens 2001). This suggests that although there has been substantial discussion about poverty alleviation since the mid-1990s when the World Bank began to shift its focus away from primarily macroeconomic approaches, towards the inclusion of good governance and strategies to assist the poor, the actual commitment in financial terms has been considerably less.

This paper provides an overview of current research and approaches to women and water resource management. It begins with an examination of the activities of some UN and other organizations and then focuses on women's productive labour in both irrigated and rainfed agriculture and in other income-generating activities. A brief overview of the uses of domestic water is also provided. Attention is given to the gendered nature of watershed development and of the effects of water-related disasters. The paper ends with some suggestions for further action points for the Food and Agriculture Organization of the United Nations (FAO) and other organizations.

## **I. The UN and other organizations**

### **The Millennium Development Goals**

In September 2000 at its Millennium Summit, the United Nations adopted a set of eight Millennium Development Goals (MDGs) (Box 3). The MDGs are inter-related and mutually reinforcing and the UN has established time bound, quantified, and monitorable targets and indicators for each goal. Although only two goals specifically mention women, none (with the possible exception of the eighth) can be achieved without giving close attention to women and to gender issues.

Research in the past 30 years has shown consistently that women are over-represented among the poor in both rural and urban settings. They have less access to land and productive resources and when they work in paid employment, they receive lower wages than men. At the same time, it has been shown that women play important roles in agriculture and food production in most parts

of the world. For this reason, the first MDG - to eradicate extreme poverty and hunger - must focus on women and their work in agriculture because they are significant actors in the provision of food security. The second goal also has a strong food security component. World Bank research has shown that increasing women's primary schooling would enhance agricultural output by 24 percent (FAO 2002).

#### **Box 3: Millennium Development Goals (1990-2015)**

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equity and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

The improvement of global food security is an underlying theme for all the MDGs because improved nutrition will have a positive impact on child mortality, maternal health, and disease resistance. However, only the seventh goal deals specifically with natural resource management. Its targets (to be achieved by 2015) are to:

- integrate sustainable development into country policies and reverse loss of environmental resources;
- halve the proportion of people without access to potable water, and;
- significantly improve the lives of at least 100 million slum dwellers.

Taken alone, each of these targets presents a massive challenge and different UN agencies have chosen to focus on each target. The UN hosted the International Conference on Financing for Development in March 2002 in Monterrey, Mexico, which was attended by government, private sector and civil society leaders in addition to senior officials of all the major intergovernmental financial, trade, economic, and monetary organizations. The Monterrey conference reaffirmed the commitment of the broader international community to meet the MDGs by 2015. The World Bank estimates that an additional US\$40-60 billion will be needed annually to meet the Millennium Development Goals.

Several of the MDGs have strong cultural implications and it will be difficult to achieve them exclusively through the infusion of money and development assistance. As will be discussed below, experience has shown that food security problems cannot be addressed simply with the provision of technical solutions. In most cases it is necessary also to change attitudes, values, and laws, both statutory and customary, to make food production more efficient, worldwide as in many cases women farmers have been disadvantaged by existing laws, attitudes, values and practices.

### **International Fora for Natural Resources: Water**

Since the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, numerous rural development initiatives have focused specifically on water. Agenda 21, the action plan that emerged from the conference, provided FAO with an impetus to establish its Special Programme for Food Security (SPFS) in 1996. Its objective is to assist with the improvement of food security at national and at household levels on an economically and environmentally sustainable basis, and to improve people's access to food.

**Box 5: The Dublin Statement on Water and Sustainable Development**

**Principle No. 3 - Women play a central part in the provision, management and safeguarding of water**

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.

<http://www.wmo.ch/web/homs/documents/engli>

Effective use of existing water resources has been an important focus of the programme. More recently, FAO has established regional strategies and programmes aimed at raising food security in low income, food deficit countries through multidisciplinary and participatory approaches. Priority will be given to structural reforms, harmonization of policies, reduction of trade barriers, and development of human resources at both national and regional levels. Other initiatives are also underway. For example, FAO's TeleFood programme, established in 1997, is raising international awareness about the problem of hunger by sponsoring concerts, sporting events and other activities. Since its start, the campaign has generated more than US\$10 million in donations. Money raised through TeleFood pays for small, sustainable projects that help small-scale farmers produce more food for their families and communities.

Important principles about the effective management of world water resources emerged from the International Conference on Water and Environment in Dublin in 1992. For the first time, there was a specific focus on the role of women and this was clearly recognized in the third of the four guiding principles for the action agenda that came out of the conference (Box 5).

Further support for the integration of gender into water resource management came from the first two world water forums (Marrakesh, 1997 and The Hague, 2000). The Third World Water Forum, slated for March 2003 in Kyoto, Japan, will also have sessions on gender and water and water and poverty. It is evident that the relationship between gender and water is being recognized. Whether that recognition has led to concrete improvement in women's water rights is less clear. The UN has declared the year 2003 as the International Year of Freshwater and there is hope and expectation that progress will be made towards a greater inclusion of women into water resource utilization and management.

## Water Programmes

Increased water-related activities are also underway in the research sector. The CGIAR system established a Challenge Programme on Water and Food in November 2002 to focus on a “pro-poor” approach...“All projects, will ... take special care to design research frameworks that take gender issues into account wherever relevant” (CGIAR 2002:8). This wording is vague and to date only one of the five working groups has set a research question that specifically mentions women. The global and national food and water system working group asks: “How can the rights and access to water of the poor, women, and socially excluded groups be established and safeguarded in the processes of global and national demographic, economic and political change that are shaping the developing regions?” and “How will changes in global water cycles affect food provision and the access of the poor, women, and disadvantaged groups to ecosystem services” (CGIAR 2002:24, 26).

### **Box 6: FAO Activities for the International Year of Freshwater**

On going activities include

- water resources inventories and evaluation;
- development of a global water information system;
- water policy formulation and river basin planning;
- improved water use technologies and management tools;
- water development and irrigation expansion; and
- water quality control, conservation and environmental effects projects.

<http://www.wateryear2003.org/>

Finally, the FAO is putting increased emphasis on the provision of water for food security and has identified three basic concerns: to produce more food with less water; to protect water quality and the environment, including human health; and to close the food consumption and production gap, particularly in Africa. Although the FAO’s on-going activities are stated in gender-neutral language (Box 6), the organization’s Gender and Population division has developed a set of tools and methodologies aimed at ensuring that gender concerns are integrated into all of its on-going work.

## II. Integration of Gender Concerns into Water Programmes

### Water Policy and Strategy: the Gender Issues

Over the past decade and longer, most bilateral and multilateral donors have publicly emphasized the need to integrate gender analysis into their programming. As already noted, the extent to which this actually occurs is questionable.<sup>1</sup> One reason for this lack of congruence between stated intentions and actual practice is that water-related projects usually have strong technical components and are implemented by engineers who rarely have requisite skills and training to integrate gender concerns (van Koppen 2002; Zwarteveen 1998; Rathgeber 1996). This is especially true in watershed or irrigation development projects. In response to this problem, FAO developed its SEAGA<sup>2</sup> Irrigation Sector Guide in 2001. Intended for use by a wide audience, including irrigation engineers, members of multidisciplinary identification and formulation missions, staff of rural development projects, government employees, staff of NGOs and engineering and consulting firms, the purpose of the guide is to support gender sensitive participatory planning of irrigation schemes and to integrate socio-economic and gender issues into the planning process. The ultimate aim of the SEAGA guide is to improve irrigation scheme performance while strengthening the position of rural women and disadvantaged groups (FAO 2001).

The role of international agencies such as development banks or bilateral donors, which often provide a significant proportion of the funding for large-scale water projects, is of critical importance. Van Koppel (1998) notes that in the development of irrigation projects, agencies often take on the task of defining local water rights by articulating and formalizing both their own obligations and rights and of those of water users. Further, the agencies define who will be the users of the irrigated water, among all the potential land users in the communal area. Criteria may include land ownership, as opposed to land use, or men only, heads of households, or both men and women. These decisions are usually enforced through the creation of water users' associations. In cases where the agencies are not familiar with the prevailing social and cultural practices or where they are insensitive to or unaware of the different rights of men and women to natural resources, including land and water, there is a strong possibility that the poorest members of the community, including women, will be disadvantaged. This is illustrated in several of the irrigation projects that are described below.

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<sup>1</sup> For example, the Asian Development Bank (ADB) has a clear, well-articulated institutional framework for the incorporation of gender issues into water and sanitation projects, but a brief review of their on-going projects in the water and sanitation area reveals that only four out of 20 mention the word "women" or "gender" in the project description. This is by no means unique to the ADB. Similar observations can be made about other agencies

<sup>2</sup> Socio-Economic and Gender Analysis (SEAGA)

## **Water Projects and Water Management: Power and Powerlessness**

Based on the principles adopted at the Dublin Conference in 1992, water planners worldwide are trying to satisfy a combination of environmental, economic, and social concerns. In most communities, water supplies are limited and water use decisions involve difficult choices. Different users and categories of users have varied needs, priorities and expectations. For this reason, the social status of the potential user and his or her wealth, influence, and credibility in the community, can become important determinants of the choices that are made. As suggested by Jackson, environmental relations can be understood as primarily social relations (Jackson 1998). While ecological or environmental concerns may be part of the decision-making process, these are often overtaken by more instrumentalist, immediate concerns. Most often impact studies are done after water resource decisions have been taken, rather than at the planning, design and construction phase (van Koppen 1998).

Decisions about water policy, allocation, pricing and monitoring are important in the development of sustainable water systems. There is much potential for a lack of

### **Box 7: Representation of Women in Water Management**

The "water world" is almost solidly male. The gender distribution of participants at world wide water symposiums and fora shows a marked discrepancy between the number of women and the number of men participating. Only 20-30 women out of 503 participants were involved in the Marrakesh forum (1997), and 10 women out of 115 persons attended the Consultative Group meeting of the GWP (Global water Partnership). These statistics are representative of the gender breakdown of decision-makers in most leading organizations in the "water world". The World Water Council has 32 board members, of whom 3 are women; the International Water quality association has no women on the board; and the Steering Committee of the GWP includes only 2 women to 17 men. Athukorala, Kusum (1997)

objectivity when these are made by individuals or institutions that have a vested interest in the outcome (Solanes and Gonzalez Villarreal 1999). At both the macro and micro levels, this is equally true if women are not involved in decision-making about management of local water resources. Box 7 denotes the weak representation of women in international water meetings and decision-making.

There may be the occasional need for government intervention to ensure that poor grassroots communities actually participate in water resource decision-making. In South Africa during a public consultation on water legislation, lengthy briefs were submitted by industries but community-based organizations, village-level water committees and NGOs were much less vocal (Solanes and Gonzalez Villareal 1999).

In face of the increasing global water shortage, resource economists often recommend that water prices be raised for all uses (industry, agriculture, and domestic). It is argued that higher prices will encourage more efficient use of water in all sectors. However, the implications for the poor can be negative and lead to increased hardship since they often do not have sufficient financial resources to pay higher prices. While subsidization of

water prices has sometimes been suggested as a means of ensuring that water is available for all, the poorest households tend to live further away from piped services or irrigation perimeters (Webb and Iskandarani 1998). It should also be noted that there is a high level of inefficiency in the delivery of water supplies in most countries (Box 8).

In some regions, public/private partnerships are increasingly becoming part of national water management strategies. While this has so far been true mostly in the domestic supply and sanitation sectors, public/private partnerships are beginning to become prominent in the irrigation sector. Again, this may be disadvantageous for women, especially female farmers, who do not have sufficient financial resources to pay higher water user fees.

**Box 8: Water Losses**

About half the water in drinking water supply systems in developing countries is lost to leakage, illegal hook-ups, and vandalism. In some countries, drinking water is highly subsidized for those connected to the system, generally more affluent people, while poor people, not connected to the system rely on expensive water sellers or rely on unsafe sources (Johannesburg Summit 2002).

It is clear that the participation of women in water resource management must be seen as a positive good and promoted by national governments. Although this has been articulated in many international fora, including the Dublin Conference, few governments have actually operationalized this concept in their national policies and legislation governing water issues. South Africa offers a rare positive example, notwithstanding the difficulties discussed above. The country passed its Water Services Act in 1997 and a National Water Act in 1998 which aimed to redress the gender and racial inequalities and discrimination of the past (Schreiner, van Koppen and Khumbane 2002). While changes are being made slowly, the fact that the legislation exists is in itself highly significant.

Finally, in some cases, women are taking the lead in their communities to protect water resources. For example, in northeastern Brazil, the Rural Women Workers' Movement has mobilized women to revitalize a small local river in the water scarce area. This involves community education, i.e. teaching local people not to dump their sewage into the river, in addition to planting native species of trees along the river banks. Women activists are undertaking this project without government support, hoping that if they are able to demonstrate success the government will initiate and support other similar efforts (Branco and Almeida 2002).

## **The Gendered Nature of Water Use**

Women's participation in the utilization and management of water resources must be looked at in the broader context of the social construction of gender roles in different regions, and their access to productive assets and resources. Conceptually, researchers are still trying to develop methodologies, frameworks, toolkits and indicators to understand the multiples uses and values of water in developing countries. Some analysts have placed gender at the centre of their framework. Others put economics or environment at the centre. It is clear that there is no single construct that facilitates an understanding of the complex relationships among women, men, and natural resources. Approaches must

be developed through situation-specific contexts and acknowledge that the gendered nature of relationships with water, soil, forests and other natural resources continues to change over time. Most importantly, it should be recognized that although women have often been disadvantaged and have lost rights and status as agricultural systems became increasingly technology-based and commercialized, there also have been instances where they have benefited from changes, sometimes as a result of their own negotiations to ensure that they received benefits or rights. Unfortunately, when gender is integrated into development projects, women frequently are seen as a “marginalized” or a disadvantaged group (and often put into a category with children). This tends to reinforce the idea that women are victims rather than strong partners in development.

Since the mid-1990s, the World Bank has put increased emphasis on poverty reduction as a key development goal. Substantial research has been done on gender and poverty issues and considerable attention has been given to women’s role in agricultural production. Women’s disadvantaged position with respect to access to productive resources such as land, labour and financial services, is often mentioned as a key reason for the greater poverty of female-headed households. Interestingly, however access to water is not in itself seen as point of vulnerability (Blackden and Bhanu 1999). Discussion of access to water usually is often seen in domestic terms, i.e. time spent on water collection or the availability of adequate water and sanitation services. FAO seeks to link “access” to productive activities such as the use of time and energy spent in fetching water that is lost or wasted and detracts from the overall productivity and efficiency of women. However, the problem faced by many female farmers is that they have very little or no access to water for agricultural purposes and are entirely dependent on rainfall.

Finally, a group of economists have recently developed a “Water Poverty Index” (Box 9) to quantify the relationship between water and poverty (Lawrence, Meigh, and Sullivan 2002). Their conceptual framework is based on five main components: resources, access, capacity, use and environment. Gender is not included.

**Box 9: Water Poverty Index**

The Water Poverty Index is an interdisciplinary measure that links household welfare with water availability and indicates the degree to which water scarcity impacts on human populations. Such an index makes it possible to rank countries and communities within countries taking into account both physical and socio-economic factors associated with water scarcity. This enables national and international organizations concerned with water provision and management to monitor both the resources available and the socio-economic factors which impact on access and use of those resources.

<http://www.nwl.ac.uk/research/WPI/>

In most parts of the world, women are major actors in agricultural production. Their knowledge of local biodiversity, soil, and water conditions is a significant factor in their capacity to contribute to food security. In some cases, e.g. in many African societies, they are often the most important producers of food for local consumption. In other cases, e.g. in Asia or Eastern Europe, they are often employed as agricultural labourers or work with their male relatives on family farms. In still other cases, as in parts of the Middle East, they may be most prominent in post production processes and work in the fields only during periods of labour shortage. It is clear that we cannot generalize about the role of women in

agriculture as it varies so much across regions and across time, since their roles have often changed in response to male migration or to changes in agricultural production systems. However, it is worth noting that many national governments and international development programmes continue to consider women primarily as family labourers rather than farmers (Pangare 1998). In all parts of the world, relatively few women own land. An FAO study in India, Nepal and Thailand found that only 10 percent of female farmers actually owned land and an IFAD study in Syria showed that only 5 percent of women owned land (FAO 2002).

## **Irrigated Agriculture**

Irrigation is by far the largest user of the world's water, but many irrigation systems are highly inefficient, losing up to 60 percent of water in evaporation or return flow to rivers and groundwater aquifers (Johannesburg Summit 2002). Environmental damage is often caused through salination of soils and water-logging. Partly because of the high cost of irrigation projects, investment in the sector is declining. The International Food Policy and Research Institute (IFPRI) and the International Water Management Institute (IWMI) estimate that by 2025 water withdrawal for domestic, industrial and livestock use will increase by at least 50 percent over 1995 levels. Irrigation water will increase by only 4 percent during this time, which IFPRI predicts could lead to even greater food security problems as farmers face relative declines in water supply (Rosegrant, Cai and Cline 2002). Similarly, FAO makes a strong argument for the continued importance of irrigation as a central element in the improvement of agricultural production systems and sees this as a critical factor in efforts to achieve food security (FAO 2000). Indeed, its commitment is illustrated by the Special Programme for Food Security (SPFS) in which irrigation is one of the main components.

Irrigation has increased crop outputs, allowed the diversification of crops and the introduction of higher value crops, enabled the utilization of technologies aimed at increasing yield, and provided employment for the landless poor (van Koppen 1998). However, to date there is no consensus that irrigation actually alleviates poverty. Indeed, there is conflicting evidence from different projects and regions (CGIAR 2002). A recent review of a set of World Bank irrigation projects that became effective after 1997 found that less than half (47 percent) had addressed basic poverty issues, 11 percent had special assistance components for the poor, six percent monitored impact on the poor and 23 percent had special provisions to assist female farmers (World Bank 2002). A review of irrigation projects worldwide suggests that they tend to favour richer farmers. Poor men and poor women rarely benefit.

The expansion of irrigation schemes is often achieved at the cost of evicting tenant farmers, buying out of marginal farmers, and expropriating land formerly used by the poor (van Koppen 1998). In most countries, access to irrigated water is mediated by race, social status and gender. For example in South Africa only five percent of irrigation water goes to black farmers. The remainder is used by white large scale, commercial farmers who practice primarily mechanized agriculture (Schreiner, van Koppen and Khumbane 2002). Figures from FAO in Table 1 indicate the extent to which irrigation is practiced in different developing regions and provide data on water use efficiency and water withdrawal as a percentage of renewable water. It is clear that the high level of water withdrawal in the Near

East and North Africa, coupled with an almost equally high level of inefficiency, is unsustainable over the long term.

Table 1: Summary results of agricultural water use and comparison with water resources, 1998

	<i>Total renewable water resources (km<sup>3</sup>)</i>	<i>Irrigation water requirements (km<sup>3</sup>)</i>	<i>Water use efficiency</i>	<i>Water withdrawal for agriculture (km<sup>3</sup>)</i>	<i>Water withdrawal as percentage of renewable water resources</i>
Latin America	13409	45	24%	187	1%
Near East and North Africa	541	109	40%	274	51%
Sub-Saharan Africa	3518	31	32%	97	3%
East Asia	8609	232	34%	693	8%
South Asia	2469	397	44%	895	36%
90 developing countries	28545	814	38%	2146	8%

Source: FAO, Aquastat,

[http://www.fao.org/waicent/FaoInfo/Agricult/AGL/AGLW/aquastat/water\\_use/index5.stm](http://www.fao.org/waicent/FaoInfo/Agricult/AGL/AGLW/aquastat/water_use/index5.stm)

There is a considerably larger literature about women's domestic roles related to water (including water and sanitation), than their economically productive roles. Gender issues are rarely integrated into large scale irrigation projects and women have usually been excluded or been labourers rather than land owners (FAO, n.d). Jackson (1998) suggests that the relative "success" of projects aimed at domestic water development in contrast to irrigation development, may not be due to simple stereotyping by project planners but rather be a reflection of the preferences of women themselves. She cautions against habitually seeing women as "acted upon" and argues that irrigation work may involve heavy labour and women themselves may choose to negotiate alternative arrangements to avoid this work. Jackson suggests that one strategy would be to consider how to make irrigation work more attractive to women. In contrast, van Koppen provides evidence of numerous instances of exclusion of women from participation in both large scale and small scale irrigation projects (van Koppen 1998).

While women have often been excluded from irrigation projects, the introduction of irrigation schemes sometimes upsets the delicate balance of local conditions, rights and customs, and devalues the environmental and agricultural knowledge and expertise that they have built up over generations. For example, in the Gambia, traditional swamp rice farming practices and knowledge is being lost as more land is being pushed into fruit and vegetable production for export purposes (Carney 1998). As already noted, irrigation projects have often been implemented without consideration for existing social and cultural practices and knowledge of the gendered division of labour and responsibilities. Irrigation projects introduced by international agencies are often based on European

constructs of the household, where all members contribute to a common goal and membership in the irrigation project is invested in the male head of household.

Gambia's Jahaly-Pacharr irrigation project provides a good example of the potentially detrimental effects of irrigation projects on women. With the introduction of irrigation technology, women's resource and access rights declined. They had formerly grown swamp rice in the region but when the irrigation project was set up, their land was re-designated as part of "communal" or "household" farms, under the direction of male household heads (Whitehead 1998). Although women benefited from the increased economic prosperity of the area, they became more dependent on male heads of households, providing labour for their lands, whereas in the past they had had usufruct rights of their own (Carney 1988).

The development of the Jahaly-Pacharr scheme was costly, at US\$ 46,500 per hectare, while an NGO project that helped women to develop swamp rice production during the same period, cost an average of US\$2000 per hectare. Under the new system, men claimed female labour for double cropping of rice, which they were obliged to undertake as a condition of participation in the irrigation project. Women responded in different ways, sometimes negotiating with men to try to improve their situation under the new conditions and in other cases withdrawing their labour from the irrigated fields (Carney 1998).

Similarly, an irrigated rice project in Cameroon was unable to pay for itself because women, who were not assigned land but were expected to work in their husbands' fields, withheld their labour in order to grow sorghum for family subsistence outside the irrigation scheme (World Resources Institute et al 1994). In Kenya, the Mwea Irrigation Scheme appropriated all available land, investing control in the scheme managers, who were men. Women lost rights to land they had traditionally used to grow food crops for subsistence. Consequently, women were forced to turn to their husbands for cash to buy food and became more dependent on men than they had ever been in the past (Zwarteveen 1994).

Research in Kenya on smallholder rice irrigation in the Kano Plains revealed similar inequities (Hulsebosch 1993). Most women were not active members of the water users' associations in the rice schemes and those who attended meetings were not allowed to speak before men or to express opinions in opposition to those expressed by men, although women performed up to 61 percent of the requisite labour in their own and their husbands' plots. Even when both men and women participated in irrigation schemes, their needs and priorities sometimes differed. Women were less interested in night irrigation because cultural norms made it difficult for them to work after dark. Men wanted to have watering places for cattle; women wanted communal areas for washing clothes and dishes. These different perspectives were not effectively represented by the water users' associations because women were under represented and were not given an equal voice in decision making.

In India, women also tried to negotiate informal agreements to solve their irrigation-related problems. When water projects made provisions to ensure that “at least one woman” was on water user committees, the effects were minimal and tended towards tokenism. Experience showed that at least one-third and preferably one half the members should be female and women should have specific responsibility and be made signatories to project bank accounts (Pangare 1998). In general, female participation is minimal in water users’ organizations in South Asia (Meinzen-Dick and Zwarteveen 1998). However, in Ecuador, although women’s participation in water user associations was generally weak and their decision-making role was limited, women who had higher than average levels of education did occupy positions of leadership in the water user’s organizations (Bastidas 1999).

However, there have also been successes. For example, Box 10 describes a proactive approach taken in an FAO project in Indonesia where it was recognized that special efforts would have to be made to ensure that women participated. In Burkina Faso, a case study by the Gender and Water Alliance, showed that overall productivity increased when women and men were allocated small separate plots rather than larger household plots. Women proved to be good irrigation farmers and preferred to work on their own plots. As they became economically less dependent upon their husbands, they were able to help support their relatives and increase their own opportunities for individual accumulation of wealth in the form of livestock. The effects of having an individual plot also significantly improved the bargaining position of women within households.

#### **Box 10: Proactive Approaches**

The Cidurian Upgrading and Water Management Project in Indonesia conducted a pilot programme to include women farmers in planning the project after it became apparent that they were not participating. Separate meetings and special training sessions were organized for them. The objectives were to:

- provide women with basic information on the programme
- overcome women’s initial reluctance or shyness
- make an inventory of women’s interest in participation, leading to concrete plans
- identify potential leaders and representatives for water users associations

It is clear that the gender effects of irrigation are complex and not easily understood. IWMI, based in Sri Lanka, has developed a gender performance indicator for irrigation that presents appropriate concepts, tools and applications (van Koppen 2002). This tool helps users to analyse the gendered nature of local farming systems and to examine inclusion and exclusion processes in local irrigation institutions

Finally, discussion of irrigation schemes is often based on the assumption that irrigation water is used solely for purposes of agricultural (usually cash crop) production. However irrigation water often has multiple uses. A study in Sri Lanka showed that it was being used for domestic purposes, home gardens, trees, livestock, aquaculture, and small scale enterprises such as brick making (Bakker et al 1999). A study in Morocco showed that women used irrigation canal water during periods of peak flow to wash heavy household

items such as coverlets and then laid them on the concrete canal sides to dry (Watts et al 1998). A study in Bangladesh showed that the use of ground water for irrigation had made many drinking water hand pumps run dry (Sultana 2002).

**Box 11: UNDP/FAO FARM Programme (1995)**

The FARM Programme focused on rainfed agriculture because:

- The prospects for continued expansion of output from the irrigated areas are limited and the logical option for improved food security is to turn to rainfed agriculture.
- The land use pattern is changing. Rapid industrialisation and urbanisation are impinging on fertile agriculture lands, and mainly on irrigated areas. The answer to improved agricultural output and food security is again, to focus on rainfed agriculture.
- Rainfed areas support very fragile and extremely useful ecosystems. With the growing demand for agricultural land, the pressure on rainfed areas has begun to increase. It has become essential that these fragile areas be managed in a sustainable manner.
- Rainfed areas support the poorest of the poor and are home to many indigenous ethnic minorities who themselves are generally poor. The focus on rainfed areas is an important strategy to support resource poor communities and help alleviate poverty.

<http://dbtindia.nic.in/farm/>

## **Rainfed Agriculture**

As already discussed, investment in large-scale irrigation projects is declining and water is increasingly being diverted to non-agricultural purposes. Moreover, water sources in many regions have become polluted and farmers are unable to grow high value crops. In this context, there is considerable scope for the improvement of the productivity of rainfed agriculture. The CGIAR system anticipates that new development in molecular breeding in addition to improved modeling and enhanced communications technologies can all help improve the efficiency of water use, both in rainfed and irrigated systems (CGIAR 2002). Particular attention must be given to improving the use of rainfall, of stored water, and of water with marginal quality.

In most parts of the world, women make a substantial contribution to the provision of farm labour, especially in the rainfed areas. For example, an FAO study in Lebanon showed that women were responsible for sowing, weeding, harvesting and processing. Their workloads were greater in non-irrigated than in irrigated areas, due to poorer economic standards in non-irrigated areas (FAO 1995). However, they often have little influence on decision-making processes, especially in the planning and implementation of farm activities. Since women have been excluded from irrigated agriculture, efforts to improve dryland or rainfed agriculture should be focused on women and women's crops. Yields can be improved with moisture preservation and good crop management, mulching, in-site water harvesting and short cycle varieties (Wolter 2002).

In sub-Saharan Africa, more women than men are too poor to buy inputs such as fertilizer, and they are not generally considered creditworthy by financial institutions. Recent FAO figures suggest that women receive less than 10 percent of the credit

awarded to smallholders and only 1 percent of the total amount of credit directed to agriculture in Kenya, Malawi, Sierra Leone, Zambia and Zimbabwe (FAO 2002b).

There have been some positive initiatives in the improvement of rainfed agricultural practices. For example, UNDP and FAO established a joint Farmer-centered Agricultural Resource Management (FARM) programme in eight Asian countries in 1995 (Box 11). The programme aimed to support improved sustainable agriculture resource management and the attainment of household food security in rainfed areas. In the first phase, gender analysis was not given special attention but it was soon recognized that gender is an important determinant of agricultural outcomes in terms of resource management and productivity. In the second phase, gender analysis became a central part of the initiative and NGOs, government extension workers and others regularly received training to ensure that the benefits and opportunities reach both women and men. Male and female farmers also received training in gender analysis and in resource mapping, daily time profiles, seasonal calendars, Venn diagrams, and community needs assessment. This led to the creation of community development and resource management plans. Women started to participate actively in decision making and to take leadership roles in management. For example, in Vietnam, a rotating fund was managed entirely by women. In the two sites in Nepal, women assumed responsibility for organising adult literacy classes. The FARM programme has ended but it provided some important insights and practical experience on how communities can be encouraged to integrate gender analysis into their farming practices.

## **Fisheries**

In fisheries, as in agriculture, the contribution of women at both subsistence and commercial levels is rarely recognized by appropriate national, regional and international institutions. In the Pacific, the total fishing yield supplied by women fishers is 32 percent in American Samoa and between 25 and 50 percent in the Gulf of Papua New Guinea. In the Fiji Islands, invertebrate sales averaged 2000 tons, over a three-year period in the late 1990s, with salt- and freshwater clams, which are exclusively harvested and marketed by women, comprising about 48 percent of this volume (Kronen 2002). Despite these levels, women's contribution continues to be underestimated and undervalued.

Research has shown that women in Africa and Asia are active in river, lake, pond, canal, and sea fishing. In many areas, they take leading roles in the development of aquaculture. Aquaculture provides both income and family nutrition in Lesotho and other southern African countries participating in FAO's Aquaculture for Local Community Development Programme. Women often manage small household ponds where production is aided by warm water and plentiful food, while nutrient-rich runoff promotes plankton growth. Aquaculture has proved to be sustainable because it does not reduce the water resource or conflict with most other uses, except for domestic use. Again, women are able to integrate their productive activities in aquaculture with their other agricultural and household activities. In many regions, women have become very active in aquaculture.

An aquaculture project in Tamil Nadu, India provided a valuable source of year-round income for poor women who were able to cultivate ornamental fish in backyard pools.

While fish farming was common in the area, it normally employed males, partly because women were unable to spend long hours at distant fish ponds and hatcheries. By developing fish ponds close to their homes, they were able to combine their household chores with productive labour (Shaleesha and Stanley 2000).

In coastal and lake fisheries, women often perform most of the work of feeding and harvesting fish, and also process the catch and sometimes undertake marketing. In some regions, women's contribution to fisheries is considerable and it is especially important in resource-poor households where fish are an important source of family protein. An FAO project in West Africa in the late 1960s continues to have an impact to the present day (Box 12). In many regions women process the fish catch which may include sun drying, salting, smoking and preparing fish and fish-derived cakes. The Chokor oven had a considerable impact in lightening the labour involved in fish smoking and because of its fuel efficiency, it required less firewood (which not only had a positive environmental impact but also reduced the time women spent collecting wood.)

Finally, in many parts of the world, traditional patterns of fisheries are changing. A study of fishing practices and coastal conservation in Mozambique and Tanzania found that the strong traditional sexual division of labour was starting to be affected by the changing demographic profiles of the regions (Golder 2002). In Mozambique women were still not permitted to fish, but in Tanzania some women had started to fish, against traditional practice, because large numbers of men had left the coastal areas in search of employment elsewhere. The study also found that both men and women in Tanzania practiced environmentally destructive means of harvesting sea resources. Men tended to fish in open waters and often used dynamite and poison. They also cut mangroves and used the wood for construction of boats and homes. Women used mangrove for fuel wood and charcoal and for sale in markets. They also collected seaweed, crustaceans, oysters and turtle eggs. The poorest women tended to be most destructive of the marine ecology, collecting marine resources to contribute to their own survival. However, women proved to be more open to changing harmful environmental practices although they were less likely to be included in environmental protection training and workshops.

#### **Box 12: The Chorkor Oven**

Developed by FAO and Ghana's Food Research Institute, the Chorkor is easy to use, has a high capacity, uses little fuel wood, results in shorter smoking time and produces high-quality smoked fish. The Chorkor oven has demonstrated the potential of traditional technologies to meet present day challenges. It has raised the income, living standards and nutritional status of fishing communities in Ghana. Not only has its successful example encouraged younger women to take up fish smoking as a profession, but it has also spawned integrated programmes leading to the further socio-economic and rural development of the fishing communities. The Chorkor oven has received wide acceptance in most western, central and eastern African countries and to date, Cameroon, Ethiopia, the Gambia, Kenya, Lesotho, Nigeria, Sierra Leone, Tanzania, Uganda and Zambia have demonstrated their commitment to adopting this simple and cost-effective technology.

**Box 13: Women in Fishing Communities in Pakistan**

While traditional fishing communities still tend to be liberal vis-à-vis women, this is not the case with the large number of agricultural communities who now derive their livelihood from the fisheries, following their displacement from agricultural activities in the Indus deltaic area. Agricultural societies have usually been rigid with regard to the accepted roles of women. Women tend to be considered as a commodity whose ownership rests with the male and are often confined within the four walls of the house in the name of morality and decency. Many of these values have now also been transmitted to fishing communities (Shah 2002).

In Pakistan, coastal women have lost some of their freedom as a result of migration. Women in fishing communities traditionally enjoyed more freedom and rights than those in agrarian communities (Box 13) but as resource poor farmers have been driven off their land and moved to the coastal areas, they have brought with them a set of values that imposes greater restrictions of movement on women. Moreover, with the commercialization of the fisheries and the entry of outsiders into the coastal villages, women have been pushed out of fisheries, where they traditionally played strong roles and had considerable independence. They also have been pushed out of net weaving, a second traditional source of employment, with the increased tendency

for fishermen to use imported nets (Shah 2002).

Finally, fisheries is a less important source of employment in the Middle East/North Africa region. Only about six percent of the rural population is engaged in fisheries production and women play very limited roles. Some may be involved in net-making and net maintenance and women in Egypt, Sudan and Cyprus are engaged in some marketing of fish and fish products. In Morocco, Egypt, and Turkey, women are involved to a limited extent in processing fish, while in Mauritania, women process fish for food and medical purposes, as well as assist men in dam and dike building (FAO 1995)

## **Watershed Development**

Watershed development programmes have often had a negative effect on the poorest sectors of the community. Although they are sometimes important sources of employment in rural communities, there is considerable evidence that they can increase poverty because they tend to displace the poorest sectors (CGIAR 2002). The majority of watershed projects have given emphasis to the physical and technical planning aspects and less attention to the economic, social and environmental and ecological concerns. Equity issues have usually not been a prime consideration. In recent years, FAO has emphasized the development and refinement of national policies and programmes related to integrated and participatory watershed management activities. The important role of watershed management, especially with regard to water resources and food security, has received high priority.

Experience in India has demonstrated the need for communities to become key actors and decision makers in watershed management. In recent years there has been a move towards the development of participatory methodologies for watershed management, relying on the creation of self-help, community-based watershed management

committees. However, there is still a possibility that the less advantaged members of the community (e.g. women, youth, the landless) will not be members of the committees. Special efforts have to be made to include them and one possibility is to allocate blocks of common land exclusively for their use (Wolter 2002).

Women do sometimes participate in watershed management, for example, undertaking work to reduce soil erosion by maintaining forest cover and reducing the risk of floods and silting of reservoirs and waterways. However, training programmes on the technical and scientific aspects of watershed development are usually aimed at men. Training for women tends to be concentrated on practical issues such as tree planting. Ultimately this means that women do not have the necessary skills, knowledge and confidence to participate in community decision-making and to assume leadership roles in management of watershed development (Pangare 1998). Gender analysis has not been a component of most watershed development projects.

#### **Box 14: Sustainable Watershed Management in Vietnam**

Thanks to a seminal on-going FAO project in Viet Nam, local communities have been empowered to improve their livelihoods, strengthen food security and work towards environmental stability in their watershed. Located in a protected watershed area, upstream from the important Yen Lap irrigation reservoir, the project seeks to create a visible, measurable and sustainable impact on the watershed conditions in the midland and upland areas of Hoanh Bo. Key to the project is the concept of participatory information generation and planning. Phase one succeeded in decentralizing the management of the watershed, and entrusting provincial, district and communal authorities to plan, implement and monitor development initiatives in Hoanh Bo. The project empowered local farmers: they played a key role in the planning process, and were given the opportunity to voice their needs and aspirations. The goal of phase two of the project is the complete involvement of the project beneficiaries in negotiating, planning, implementing, monitoring and evaluating the project. Accordingly, phase two will focus on building local capacity to effectively manage not only the project, but the renewable natural resources on a sustainable basis.

Similarly the impact of displacing local populations to accommodate large dam projects has rarely been analysed from a gender perspective (Baruah 1999). In some cases, planners actually have been aware of the costs of not incorporating gender concerns into relocation plans but they have rarely followed through on this awareness. The World Bank's on-going Sardar Sarovar project on the Narmada River in Gujarat, India will displace population currently residing in the planned reservoir area. Women will be adversely affected since they are responsible for collecting fuel wood, food, fodder and water. Earlier experience has shown that when populations are displaced due to dam-related projects it becomes more difficult to collect these resources because all available water is channeled into the dam and all adjoining land becomes out of access to local populations.

While watershed development projects have had mixed results, there have been some successes. For example, an FAO project in Vietnam has had a positive impact on local

communities, developing new sources of employment and income for both men and women (Box 14).

However, the effect of watershed development projects on women can sometimes be highly negative. In large resettlement projects in India, women have been adversely affected by the breakdown of existing and traditional villages and social units. They often have to leave relatives and friends and sometimes lose touch with adult daughters who have married into nearby villages that will not be displaced. However, women are seldom provided with compensation. In most cases, adult males, who are considered the “heads” of family receive monetary compensation and are allocated new land. Thirdly, widowed women and unmarried adult daughters have received fewer or no benefits and deserted women have not been considered at all (Baruah 1999).

When impacts of watershed development projects are described, it is almost always from a “gender neutral” perspective (Box 15). This tends to conceal the differential impact on different members of the community and on men and women.

#### **Box 15: Watershed Development in India**

In India, a watershed development project successfully brought nearly 1 000 ha of severely degraded land back into production, improving food security and sustainability in an area where 52 percent of all households lived below the poverty line. Water availability was also enhanced considerably, allowing farmers to expand irrigated areas from 11 percent to 79 percent of the total cultivated land. Farmers were able to start growing high-yielding, high-value crops that require more reliable water supplies, such as wheat, groundnuts, soybeans and vegetables. Average crop yields increased more than ten-fold and farmers more than doubled the average number of crops grown on the available land, from 0.7 to 1.7 crops per year. The higher productivity helped boost farmers’ incomes by over 600 percent. Employment generated by the scheme helped landless members of the community increase their income from less than US\$40 to US\$360 per year – a nine-fold gain in a span of just seven years. (FAO 2002).

### **Beyond the Agricultural Sector**

Aside from agriculture, the informal sector is the most important single source of employment for poor women. In most countries both rural and urban women are involved in petty trading, sale of cooked food, and brewing of ale and beer or other traditional drinks. Other informal sector activities typically undertaken by women include running tea kiosks, processing and selling street foods like rice balls, roasted maize, or groundnuts, producing handicrafts; selling charcoal or firewood; tailoring; and making dresses.

Commonly, women’s informal sector activities are extensions of their domestic roles, and they often operate directly from their homes, sometimes relying on assistance from their children. Most of these businesses require a low initial capital outlay, but access to water is often essential for both production and sanitation. There has been little analysis of the importance of access to water in women’s choice of particular informal-sector business

activities, in the success or failure of their businesses, or in the capacity to expand their business activities. A study of urban agriculture in Nairobi revealed that urban food production is an important source of family food and additional income for women but that women's access to irrigation was minimal (Freeman 1993).

A study of women's petty-commodity production in rural Uganda revealed that economic necessity, either that of providing basic support for their families or that of supplementing inadequate incomes of their husbands, was the basic motivating factor for participation in informal sector economic activities (Kyomuhendo 1992). In no case was economic independence or a general desire to improve socioeconomic status a primary motivating factor. More work needs to be done to verify these findings in other countries, but it seems that rural women engage in informal sector work primarily as a family survival mechanism. If this is indeed the case, then there is a strong argument for incorporating their needs for access to water for economic production into water resource planning and for assigning such needs the same priority as is assigned to the needs of male small scale entrepreneurs.

## **Domestic Water**

Collecting water for domestic purposes is undertaken by women and children in most countries. However, this is sometimes mediated by culture and religious tradition. For example, in Morocco, male children have responsibility for collecting water. Older girls take on the task if there are no appropriately aged male children. Adult males collect water if there are no children present and married women collect water if all other household members are away (Watts et al 1998).

### **Box 16: Walking for Water**

One third of women in Egypt walk more than an hour a day for water; in other parts of Africa, women spend as much as eight hours collecting water. The average distance walked by women in Africa in search of water is six kilometers per day (UNFPA 2002).

The amount of time and effort required to fetch water in many societies has often been recorded (Box 16), but it is important to note that patterns of water collection, use, and contact change according to season. Although time is important, it is not the only and sometimes not the most important factor that influences women's water collecting behaviour. A study in Zimbabwe found that women preferred to collect water from more distant but reliable wells than from unreliable alternative sources, located closer to their homesteads (Waughray, Lovell and Mazhangara 1998).

Cultural preferences and patterns are important. A study in Egypt showed that women and men believed that canal water lathered clothes more effectively and made them whiter, so they preferred to wash their clothes in the canal (where risk of exposure to schistosomiasis was higher) rather than washing them under a tap or in a washing machine (El-Katsha and White 1989). Studies have shown that the source of water chosen for domestic uses is dependent not only on availability but also on convenience. Research in Morocco showed that women performed some tasks at a more distant water

source rather than at nearby wells, because of the physical effort and strength involved in lifting the water from the well (Watts et al 1998). Additionally, if facilities for the disposal of waste water are not readily available, it may be easier to perform domestic tasks such as washing dishes or clothes away from the house.

The World Health Organization (WHO) states that at any given time, one-half of all people in developing countries are suffering from one or more of six main diseases associated with water supply and sanitation: diarrhoea, ascariis, dracunculiasis, hookworm, schistosomiasis and trachoma. (WHO 1996). WHO estimates that 3,300,000 people die annually from diarrhoeal diseases and a further 1,500,000 die from malaria (which is also related to poor water management and storage, operation of water points and drainage).

#### **Box 17: Sanitation**

Poor sanitation is a major source of disease and mortality but in 2000, there were 31 countries in the world where less than half the population had access to adequate sanitation facilities such as a connection to a sewer or septic tank system, a pour-flush latrine, a simple pit latrine or a ventilated improved pit latrine (UNDP, **Human Development Index**, 2002).

Hygiene education has been a standard part of water and sanitation projects, but a recent evaluation of Ghana's Upper Region Water Supply Project found that women's sanitation and hygiene behaviour had not improved substantially despite almost 20 years of health education. The evaluation found that hygiene education was usually an "add-on" to water projects and educators were primarily male civil servants doing a second job. They also found that men dominate water use committees although women do most of the work such as keeping the pump site clean, collecting water and paying water tariffs (Kendie 1999).

The relationship between irrigation and health is also important. Irrigation and other water development projects are often breeding grounds for schistosomiasis. Villagers living near the Richard Toll irrigation project on the Senegal River showed an almost 100 percent infection rate in people above five years of age (Watts et al 1998).

Although in Africa more women than men are now effected with HIV-AIDS, women carry the bulk of responsibility for looking after sick family members. The time and attention required by AIDS-effected patients places another heavy burden on women, who are often mothers, grandmothers, or aunts of adult patients. The household need for water to nurse the sick is increased while at the same time the available labour for fetching water is decreased.

Finally, the numbers of ageing women are increasing worldwide, and lack of safe drinking water, a gender-based division of domestic chores (including the carrying of water), environmental hazards, such as contact with polluted water, agricultural pesticides and indoor air pollution, all have a cumulative negative impact on the health of women in many developing countries (WHO 2000).

## Disaster Preparedness and Response

### Box 18: Some Water-Related Disasters in Asia, 1998-2000

Floods throughout **Asia** in 1998 killed 7,000 people, damaged more than 6 million houses and destroyed 25 million hectares of cropland in Bangladesh, China, India and Vietnam.

In September, 2000 flooding and landslides in **Japan** forced the evacuation of 45,000 people caught by flood waters; the rainfall was the most in a 24-hour period ever recorded since records began in 1891.

In September 2000, heavy rains in **Southeast Asia** resulted in unprecedented flooding along the Mekong River and its tributaries. Damage was widespread:

Flood waters inundated parts of northern Thailand, damaging more than half a million hectares of cropland

Nearly half a million people in the Mekong Delta (in Cambodia and Vietnam) had to abandon their homes

In Cambodia, rising flood waters submerged close to 400,000 hectares of cropland; emergency supplies were distributed to 1.4 million people

In Laos, over 18,000 families had to be evacuated from flood plains and the rampaging waters severely damaged just under 50,000 hectares of cropland

Flooding and drought are the two most common forms of “natural” disaster, worldwide (Webb and Iskandarani 1998). Most flood and drought-prone countries do not have natural disaster plans in effect with the result that humanitarian assistance at time of crisis is scattered. Box 18 presents an overview of the destruction caused by just a few of the water-related disasters in a recent two-year period. It is clear that the magnitude of the problem caused by floods alone is immense. Since large scale flooding often contaminates drinking water, women are faced with the necessity to find clean water sources often under very difficult conditions.

However, by far the most important cause of emergency evacuation and displacement is not natural disasters, but armed conflict. This has led to the creation of huge refugee communities in many regions of the world. Both male and female refugees are faced with the effects of human rights violations, political instability, absolute poverty, social disintegration, lack of resources, and environmental degradation. However, since women have the primary responsibility for collecting wood and water for domestic uses and looking after family health, disaster situations, whether caused by natural phenomena or by

human interventions, cause special problems for them.

In Bangladesh, a Flood Action Plan was developed between 1989 and 1995 but although the focus was on giving protection to Bangladeshi farmers, a gender analysis was not included until international consultants and donors made strong appeals for this to be added. Gender analysis revealed that women’s normal responsibilities were greatly increased during the flood season, that there were many more female-headed households than planners had known, and that they tended to be the most economically vulnerable

and often socially marginalized. They were also less likely to benefit from flood relief and rehabilitations. Moreover, women tended to have less valuable assets to sell or use as collateral for emergency borrowing (GWA 2002). Women in purdah are especially vulnerable since their mobility is restricted and they have had less opportunity to develop coping strategies outside the family compound.

Some of the gender-specific aspects of disaster include:

- increased economic insecurity;
- loss of productive assets;
- women become sole earners (since men often leave after disasters);
- women lose entitlements (relief agencies consider them to be supported by husbands);
- self-employed women lose work; and
- women lose jobs and work time (Enarson 2000)

Box 19 below describes the gendered reactions of Pakistani villagers in times of flood. It is clear that there are very specific patterns and practices and that these should be taken into consideration in emergency-preparedness planning.

#### **Box 19: Gendered Responses in an Emergency Situation**

According to villagers, floods affect the existing life patterns. In the event of flood, women are separated from men. With the onset of floods men go out of the locality taking cattle to safe places. Women locate to high places and shift the utensils from their households. If water rises further, women bind trees with ropes and climb on with the children and elders for safety. By the time this eventuality takes place hardly any men are left in the villages. Therefore women have to manage with children and the old persons. They feel isolated without the men of the community. At this stage, sometimes relief in the form of food and other consumables may reach them. During such periods women mentioned that the usual gender division of labor changes - such as men sometimes having to prepare food and women having to cut fodder.

Madhavi Ariyabandu, Duryog Nivaran, 2000, Country report from Pakistan. (Enarson 2000)

### **III. Conclusions and Areas for Action**

This overview of gender and water resource utilization and management has shown that women have a complex relationship with water. It is clear that they are significant users of water both for productive and for domestic purposes but that they rarely have input into water decision making, either at the macro or even at the micro level.

The analysis presented here suggests strongly that planners have tended to build on traditional views about women's uses of water. Priorities have been set with the assumption that their strategic interests lie primarily in the fulfillment of household responsibilities. The important role played by women in agriculture has seldom been given consideration in water resource planning. At best, it is assumed that if water

resources are made available to “small farmers,” women will benefit equally with men. As has been illustrated, this rarely happens.

Competition over water resources is already intense in many parts of the world and by viewing the water needs of male and female farmers as essentially homogenous and by accepting the role of men as spokespersons for the entire community, donors and government planners have reduced the number of actors who have a stake in decision-making related to water resource management. However, one outcome has been that women have often been marginalized in water allocation policies. Beyond the issue of gender equality, this has not worked in the interests of solving food security problems. Women tend to be under-represented at all levels of agricultural decision-making. For example, all of the 14 ministers who participated in the 23<sup>rd</sup> meeting of the ASEAN meeting of ministers of agriculture and forestry in Indonesia in October 2001 were male. Only five of the 15 ministers of agriculture who participated in an informal meeting of EU ministers of agriculture in Sweden in 2001 were women. Recent research has shown that only one-tenth of the scientists working in the CGIAR system are women (Rathgeber 2002) and agriculture is rarely selected as a course of study by women in universities, worldwide (Rathgeber 2003).

In many parts of the world, women are key food producers and if food security needs are to be met, they must be empowered with access to productive resources, including technology, credit, extension advice, land and water. The achievement of the Millenium Development Goals of the UN is dependent on the full participation of women and it should be a priority of donors and the UN system itself to channel funds and resources to them.

One of the MDGs is to “ensure environmental sustainability” (goal 7) and one of the strategies to be employed is to “integrate sustainable development into country policies and reverse loss of environmental resources.” The achievement of this goal offers a clear opportunity to FAO and other organizations concerned with environmental sustainability, to integrate gender analysis into their programming. As has been shown throughout this review, there are many instances where this has been and is being done, however there is a need for social, community and gender analysis to be accepted as a key component of **all** agricultural development projects. In view of this, one of the objectives of FAO’s *Gender and Development Plan of Action (2002 – 2007)* is to promote gender equality in access to, control over and management of natural resources, including land and water (FAO 2003).

A large proportion of agricultural lands in different regions of the world have become unproductive as a result of deforestation, overgrazing, political instability, poor irrigation practices etc. Rehabilitation of degraded lands is a painstaking and time consuming process but it can proceed in a sustainable way only if the needs of poor people living on and around degraded lands are taken into account. This requires a detailed understanding of men’s and women’s local knowledge systems, resource utilization, and income generating opportunities.

There are specific areas in which FAO can provide assistance:

### **Policymakers**

- FAO should encourage governments to give priority to integrating gender concerns into their water resource policies.
- Many countries still require assistance with the formulation of gender sensitive policies in water related areas. Efforts should be made to target mid-level policy makers for intensive training and senior level policymakers for short introductions to some of the main concepts and tools of gender analysis.
- Other developing countries already have gender sensitive policies but little capacity within Ministries of Agriculture or of Natural Resources or Fisheries to implement them or even to fully understand the implications of such policies. Implementation guides should be prepared and presented to relevant policymakers in in-country workshops.
- Statistics on the management and use of water resources that are disaggregated by sex and age are key to good policy-making. FAO's gender-disaggregated training approaches should be adapted for water resource planners and managers to build capacity for improved fresh-water related decision-making.

### **Farmers**

- Women are under-represented in water management at all levels. Targeted efforts should be made to identify potential women leaders in rural communities and provide them with the training and skills to become active members of water users' associations. An information database should be developed about the needs and concerns of female members of water users' associations.
- Water users associations do not have a good understanding of women's concerns. Efforts should be made to provide gender training, where possible and relevant.
- Within FAO, the Special Programme for Food Security (SPFS) should ensure that gender analysis is integrated into the irrigation component. The SPFS should apply training materials like the SEAGA Irrigation Sector Guide and carry out surveys to develop a more elaborate and specific information and knowledge base about the multiple water-related needs and priorities of female farmers and agricultural wage workers.

### **Youth and Children**

- During the International Year of Freshwater, FAO country offices should sponsor essay contests on women and water-related topics. School children should be encouraged to write submissions on this topic and be eligible to win a prize. They could describe the different roles and responsibilities of men and women in the use and management of both domestic and agricultural water resources.

- A second contest, with a slightly higher financial prize, could be held for university students. When the winners are announced, the country office can ensure that the event is well-publicized in the local media.

### **Gender and Water Ambassadors**

- Country offices could be encouraged to identify a well-known and respected local person to become their goodwill ambassador for gender and water. This person – who could be of either sex – would be expected to give some public talks to the private sector, to universities and schools about the need to integrate gender into water resource planning. Goodwill ambassadors could be drawn from a variety of local institutions, including universities, the private sector, the NGO community or politics.

### **Female Professionals**

- Worldwide, there are relatively few professional women in agriculture. FAO should undertake activities to encourage girls and young women to consider agriculture as a career choice. An annual award could be given to a promising young professional woman in the agriculture field.
- FAO technical programmes in water, forestry and information should encourage the participation of well trained female professionals in the design of conceptual frameworks of irrigation schemes, settlement schemes or land reclamation activities; the design of water conservation and water harvesting research; and in the preparation of appropriate campaign and information materials.

### **Gender and Water Task Force**

- FAO should consider establishing a task force to monitor gender and water activities. Ideally the Task Force would have an annual budget to commission a set of targeted research studies on gender and water.

### **Water Management**

- FAO should take steps to ensure that a higher proportion of women participate in international and national water decision making bodies. Efforts should be made to ensure that at least 30 percent of water decision makers are women.

Some of these suggestions could be implemented very quickly; others will require more time. Given both the urgency of the problem of global food security and the strong commitment that has been clearly expressed by the UN system and by donors alike to halve world poverty by 2015, the next few years will offer many opportunities for FAO to increase its work in the area of gender and agricultural resource management. There are already many success stories. The challenge that lies ahead is to build upon these and to ensure that all members of society have an equal opportunity to contribute to the achievement of food for all.

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