Gender and water

Securing water for improved rural livelihoods:
The multiple-uses system approach

IFAD

Enabling poor rural people to overcome poverty

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Cover:

Maria Oliva Bunay Guaman rinses fruit and vegetables using water from the new irrigation system in El Tambo, Ecuador. She is a member of the local community organization, which works closely with the irrigation management board.

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Introduction

Most of the world's 1.2 billion poor people, two thirds of whom are women, live in water-scarce countries and do not have access to safe and reliable supplies of water for productive and domestic uses (IFAD 2001a). The bulk of these rural poor people are dependant on agriculture for their livelihoods and live in sub-Saharan Africa and South Asia, the regions which are also home to most of the world's water poor (Molden 2007).

One third of the world's population is currently experiencing some kind of physical or economic water scarcity. A growing competition for water from different sectors, including industry, agriculture, power generation, domestic use, and the environment, is making it difficult for poor people to access this scarce resource for productive, consumptive and social uses. In water-scarce regions and countries, inequity in access to water resources is increasing because of competition for limited resources, and this particularly affects poor rural people, especially women.

IFAD recognizes the linkages between poverty and gender issues and places great importance on women's empowerment as a means to reduce poverty and food insecurity. IFAD supports the notion that women's secure access to water and land is central to achieving the Millennium Development Goals, in particular Goal 1 (reducing by half the proportion of people living in extreme poverty and hunger by 2015) and Goal 3 (promoting gender equality and empowering women). This is also reflected in the IFAD Strategic Framework 2007-2010, which highlights gender concerns as central to enabling the poor people living in rural areas to overcome poverty.

Water development was the focus of 34 per cent of the IFAD programmes and projects that were approved during 2000-2004. Moreover, IFAD's 2000-2004 investment portfolio shows that there was a good balance between productive and social water investments, with some US$880 million (21 per cent of the total) going to agricultural water operations, and some US$562 million (13 per cent of the total) to social water development. Most of the agricultural water management programmes and projects addressed the need to strengthen water users associations (WUAs), thus achieving one of IFAD's fundamental objectives of increasing the participation of beneficiaries in the design and implementation of programmes and projects (IFAD 2001b).

This review examines the impact of water-related projects on women, women's role in managing water resources and the constraints women face in gaining access to water. It presents lessons learned in promoting women's participation in decision-making for water management using experiences from several IFAD-supported water programmes and projects. It highlights the innovative activities and catalysts that have helped to address gender issues in water programmes and projects. And it offers recommendations on how to improve women's access to water resources through equitable development and gender mainstreaming.

Women as water users, women as water and livelihood managers

Although international policymakers are increasingly recognizing women's roles in agriculture, in general and irrigated agriculture in particular, many women farmers remain poor, vulnerable to food insecurity and marginalized. Already in 1992, the central role of women in water management was recognized in the Dublin Principles (adopted at the International Conference on Water and the Environment, Dublin). Since then, policymakers have made attempts to incorporate gender issues in water development projects, including in the resolution declaring 2005-2015 the International Water for Life Decade. However, these policies have not been adequately translated into practice, and attempts in some projects to involve women in water management initiatives have met with only modest success. The reasons for these disappointing results range from lack of understanding of gender issues by policymakers and project staff, to lack of will and commitment at the project design and implementation phases, to lack of capacity among project staff in skills and the use of relevant tools, to the unavailability of gender-disaggregated data, to prevailing cultural norms in the societies. In fact, women generally have limited influence, do not exert political pressure, or are simply not heard or seen: a sign of great insensibility.

Women manage water resources not only for productive uses, but also for domestic purposes. Sanitation and hygiene for good health are their responsibility, and they often play an active role in the construction and preventive maintenance and repair of sanitation facilities. Women and girls also walk for hours to fetch drinking water. On the one hand, this fosters social and group cohesion and provides women with an opportunity to communicate with other women and people outside their homes. On the other hand, it exposes them to threats of violence and to health hazards. It also takes time away that might be used for more productive activities.

Securing water for both productive and domestic uses is critical in achieving food security and improved rural livelihoods in most parts of the world, but particularly in arid and semi-arid areas. However, despite the role that women play in reducing food insecurity through their knowledge of crop production, local biodiversity, soils and local water resources, they are often excluded from decision-making processes in new agricultural water management approaches and other projects and initiatives on natural resource allocation. This means that women have no choice in the kind or location of services they receive.

Women's limited access to water is also often coupled with their limited access to land; the two are often linked (IFAD 2001c). Securing access to land among poor farmers, particularly women, can lead to secure water rights. It can then lead to access to other resources such as financial services and investment in farms, offering the potential to improve livelihoods and reduce water wastage. However, the international debate continues to address land and water issues

separately (IFAD 2004a), and, in many countries, these issues are increasingly being decoupled.

Local (customary) governance arrangements, national governments and international development programmes continue to consider women as if they were easily disposable family labourers rather than livelihood managers, farmers, or individuals with decision-making abilities. The lack of recognition of the role women play as decision makers is one of the major reasons for women's poor access to productive resources. As a result, most of the agriculture and water initiatives that aim at enabling poor and vulnerable farmers to improve their livelihoods and provide access to productive resources fail to take into account women's concerns about the multiple uses of water. Women use water for agriculture, domestic tasks, health and sanitation, while men's water use priorities mainly revolve around agriculture or livestock.

A woman collects what water she can from a shallow source near Anchetty, India.

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Impact of water-related projects on women

Workloads and responsibilities

Women all over the world play an active role in agriculture, thus contributing to food security. In many countries, women are involved in rainfed agriculture as well as backyard or irrigated home gardening, while men often are responsible for rainfed commodities and land management aspects of irrigation. Depending on the traditions of the societies they live in, the prevailing norms and the migration patterns of men, women may play different roles in the production cycle. In some countries, for example, in sub-Saharan Africa, women are the main producers of staples and food crops; in others, they work on their family farms or as paid labourers. In yet other countries, particularly countries in the Middle East, women are mostly involved in post-harvest activities and work as unpaid family labourers only during periods of labour shortage. They and often their children suffer the most from water shortages in crop and livestock production, as well as for domestic uses.

It is estimated that women in many developing countries walk for an average of about 6 kilometers each day to collect water (UNFPA 2002). Water collection for domestic purposes is generally the responsibility of women and girls in almost all developing countries. Thus, if water supplies become scarce or contaminated, women and girls are the ones who must look for alternative sources of water. In addition, they must also provide care if family members suffer from waterborne diseases. The availability of clean water close to home reduces women's workloads, and the time saved in fetching water may be spent on other activities to strengthen livelihood resilience, including productive activities such as crop production. Therefore, women are often interested in using rainfall run-off or irrigation water for purposes other than irrigating field crops.

Most of the water supply projects in the past were developed with a single dimension; they either focused on domestic water supply or provided water only for irrigation. Communities, on the other hand, have diverse uses for water such as for agriculture, fishing, livestock watering, small businesses, kitchen gardening and domestic tasks. In the past, agricultural water management projects have not generally been designed or retrofitted to take into account these multiple uses for water within water management schemes. This trend is changing, and water projects are becoming more multi-purpose, multi-use and multi-user. The involvement of communities, both men and women, in the selection of and planning for such interventions is the key to successful gender mainstreaming.

Not addressing the multiple uses of water has been recognized as one of the causes of the lower participation of women in WUAs (IFAD 2001b). In some irrigation systems, the use of irrigation water supplies for domestic purposes is considered illegal. Some irrigation projects even have a negative impact on domestic water availability. A study in Bangladesh has shown that the use of groundwater for irrigation caused many hand pumps used for drinking water to run

dry (Sultana 2002). Similar observations have been made about some of the schemes in the Provincially Administered Tribal Areas such as the Integrated Agricultural Development Project in Pakistan. The installation of tubewells for irrigation has caused significant declines in groundwater levels and thus reduced water availability in the dug wells of nearby households.

In cases where irrigation projects have tried to incorporate other uses of water, they have often ignored women's concerns. In a smallholder irrigation scheme in the Kano Plains in Kenya, men wanted to have watering places for cattle, while women wanted communal areas for washing clothes and dishes. Because women were underrepresented in the WUAs, the project did not take the different perspectives of women into account (FAO 2003a).

Women, like men, may also have clear opinions about how an irrigation system should be operated. Because of their workloads at home and their relatively lower flexibility in terms of time, women may have different preferences for irrigation operations and the scheduling of water deliveries. Although unavoidable in certain circumstances because of the rotation of water deliveries, women tend to avoid night irrigation because of their fear of gender-based violence, sexual harassment and other hazards, as well as the difficulties in combining work at night with childcare (Zwarteveen 2006a).

Irrigation projects in many instances have also brought advantages to women. While they have provided much-needed water for irrigation in drier areas, resulting in an improvement in the livelihoods of families in general, they have also reduced women's workloads in terms of the number of hours women spend fetching water for domestic uses. Irrigation has made it easier for women's animals to be watered in convenient places (IFAD 2006a). In particular, providing water for multiple uses reduces drudgery and provides women with more time for other, more productive or livelihoods activities.

Access to irrigated land: Understanding the links between land and water governance

Natural resources are one of the foundations in the effort to overcome poverty among poor people in rural areas. Thus improvements in the management of these resources are the focus of many development initiatives and projects that seek poverty reduction by empowering poor people to improve their livelihoods. Experience shows that many challenges remain in achieving these goals in an equitable and sustainable manner.

One of the main obstacles to improving the livelihoods of poor rural people is the lack of attention given to gender issues and women's access to natural resources, in particular land and water. Although research offers evidence on women's multiple roles in agricultural production, their access to productive resources such as land, water, fertilizer, credit and other inputs remains limited.

In most developing countries, access to water for productive use in general and for irrigation in particular is intrinsically linked to access to land.[1] In all parts of the world, relatively few women own land. However, women may still obtain access to land through their families or husbands, a practice that makes them vulnerable to any change in family dynamics. In some societies in sub-Saharan Africa, a woman acquires land tenure rights for life; however, this right is transferred to the male members of the family after she dies. In some cases, a woman may lose access to land after the death of her husband or father. Without secure land tenure, women cannot obtain access to credit and membership in agricultural and WUAs. According to one estimate, only 1 per cent of the total credit directed to agriculture goes to women in Kenya, Malawi, Sierra Leone, Zambia and Zimbabwe because financial institutions do not generally consider

1 See http://www.ruralpovertyportal.org/english/topics/water/ifad/index.htm.

A farmer visits a reservoir in the mountains near El Tambo, Ecuador. The system she uses to irrigate her crops is drawn from this reservoir.

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BOX 1

Empowering women to improve their skills, knowledge and livelihoods in Peru

Most of the cultivation practices of the terraces on remote hillsides of the high Andes date back to pre-Colombian times. Although the communities there have lost much of their knowledge and skills regarding these practices over the centuries, three IFAD projects in Peru have empowered them to rebuild their livelihoods based on natural resources and to restore their lost knowledge by using the cultural identity and pride of the communities as driving forces for change. In particular, one small community has managed to keep the knowledge of ancient cultivation practices alive and serve as the source for the reintroduction of these practices.

The Management of Natural Resources in the Southern Highlands Project (Mareness) has used farmer-to-farmer training to bring about technological change and increase the capacity of farming communities to undertake their own development activities. In response to soil erosion, water loss, high production costs and social, organizational and economic conflicts in the target areas, the project has targeted 360 peasant communities in the Southern Highlands, including 26,400 rural women, to use innovative techniques for technology and knowledge transfer in irrigation methods.

The problem identified in the community of Asmayacu included soil erosion, water loss and high production costs. Thus, there was a need to improve agricultural and livestock production through plot irrigation. It was the community itself that identified this need, using a methodology transferred from Bolivia for the Marenass Project.

This methodology begins with a two-month exercise to elaborate three 'talking maps' that graphically explain the projects of the farmers. The first map presents the past situation (30 years previously); the second map details the present situation; and the third map presents the situation expected by the community in 15 years. Alongside this exercise, communities also identify a series of possible actions to improve their present situation.

Farmers needed support during this process, so well-respected local craftsmen and craftswomen were trained to provide advice on cultivation practices, run on-farm trials and disseminate information. Short-chain market linkages were also established to connect rural production to the urban demand for produce. Most women in the community have acquired skills in judging when the soil profiles are sufficiently watered, and they use *composturas*, a long-forgotten, zig-zag furrow irrigation system introduced from Peru's coastal irrigation.

The project took several steps to strengthen women's roles in project activities and their access to resources and assets. The project organized gender sensitization training sessions for both men and women. It helped to set up special measures to channel information to women and marginal groups by organizing them and supporting their participation in decision-making processes.

Marenass had a strong impact on families, stimulating a genuine process involving rethinking the roles of men and women, older people and youth within the family and fostering new opportunities for dialogue, negotiation and planning among all family members. There has been a reduction in women's workloads due to increased help from men, who now recognize women's roles within the family and in the community, and incomes and livelihoods have improved.

Affirmative action in the groups has provided an opportunity for women to expand their financial participation and demonstrate their capacity to contribute to the community and the family. The status of women has been strengthened not only in terms of their skills (financing and knowledge), but also their influence, visibility and participation in community councils. Nevertheless, there remains a huge social difference in the recognition men and women receive for their respective experience, skills and potential contributions.

Sources: IFAD 2002, 2004b, 2004c, 2006a.

women creditworthy (FAO 2003a). The Grameen Bank in Bangladesh and other microcredit institutions are an exception because they give small loans to poor men and women. Access to these resources helps the women or men use their labour more effectively by enabling them to make decisions and adjustments in allocating resources under changing economic and climate conditions.

Many irrigation and land reallocation projects have failed to incorporate appropriate gender strategies in design and implementation, which, in many cases, has exacerbated inequities in resource allocation. In many cases, women's access to land and water has declined as a result of the introduction of irrigation schemes (Van Koppen 1998; Zwarteveen 2006a). The project improved family incomes and indirectly benefited women, but women lost their control over resources (land and money) and became dependant on their husbands.

Gender-based farming systems where men and women cultivate separate fields are common in many parts of sub-Saharan Africa. This reality has often been ignored in irrigation development projects and led to gender inequity in access to productive resources. It has also resulted in the partial or total failure of irrigation schemes. Moreover, key decisions regarding site selection, beneficiaries, land (re)allocation and water rights are made during the planning phases of water-related investment projects and thus form the basis of gender inclusion or exclusion in the projects. The gender approach of agencies and projects, as well as the local class and gender hierarchies, is also one of the causes of gender-related inequities in access to water resources in sub-Saharan Africa (Van Koppen 2002).

In the Jahaly and Pacharr Smallholder Project, an IFAD-supported irrigation project in The Gambia, swampland on which women used to cultivate rice was reallocated as part of communal or household farms, often with men as the heads (IFAD 2001d; Whitehead 1998). Because men were obliged to grow two rice crops in a year, they expected women to continue providing their labour. This gave women some negotiation power over their labour if their demands were not met.

The World Bank-funded SEMRY (Société d'Expansion et de Modernisation de la Riziculture de Yagoua) irrigation project in Cameroon introduced irrigated rice crops in an area where women traditionally grow sorghum, the staple crop. The project did not take into account this fact and redistributed the land cultivated by women to men or households headed by men and assumed that women would provide their labour on the land of their husbands. The scheme failed to sustain itself because of the refusal of women to provide their labour as expected. In a similar irrigation project in Kenya, women lost control over land and became totally dependant on their husbands (Zwarteveen 1994).

Some projects try to learn from experience and, during subsequent phases, correct their mistakes. For example, a State-sponsored development project in Burkina Faso reallocated to men land that was traditionally cultivated by women. The project managers did not consult the women. They only involved the male elites of the community and did not realize that women in the area had stronger land rights prior to the implementation of this project. As a result, the women had to provide the labour for cultivation, but the men controlled the harvest. The project staff recognized this reality and tried to address the issue in the second phase of the project by developing, together with the local community, improved procedures for land allocation. Based on their negative experiences during the first phase, women were better organized this time. Thus, all former plot owners were registered in time and got one new plot in return. This gradually became formal project procedure (Van Koppen 1998).

BOX 2

Land against labour agreement: Improving women's access to fertile land for rice cultivation in The Gambia

The IFAD-supported Lowlands Agricultural Development Projects (LADEP) (1997-2005) in The Gambia addressed the landlessness of women, who are traditional rice growers. In The Gambia, rice land ownership is vested on a traditional system, whereby men who are first-settlers control and allocate rice land to their wives and daughters. The remaining sector of women rice farmers (later settlers) depend on borrowing rice land on an annual basis with no assurance of availability because the renting or sharecropping of farmland is not common in The Gambia.

To address the growing need for rice because of increased population, women's access to fertile land for rice cultivation was needed. Because of the shortage of fertile land with access to freshwater, the managers of the project decided to reclaim tidal swampland under perennial freshwater conditions. While the owners of the swampland lack the labour to undertake reclamation activities, women and other landless farmers needed incentives to provide labour for land reclamation.

The project recognized the need among women farmers to have access to land leaseholds if they were to invest their labour in swamp reclamation. Thus, the ownership of an equal piece of land from traditional landowners was transferred mostly to women in the communities that participated in the reclamation efforts. These land against labour agreements between landless individuals, mainly women, and founder settlers (landowners) were made in the presence of the whole community, conferring a traditional legal status to the agreement.

The project improved women's access to fertile swampland for rice production. About 22,216 landless women farmers, who comprised 90 per cent of the total beneficiaries, became landowners; more farming areas were opened; and yields increased in project areas.

Through women's access to land, the project enabled communities to become food secure. Food security has also increased because of increased land availability, through land reclamation, for rice production and improved yields. The LADEP experience resulted in an additional three months per year of rice self-sufficiency at country level.

Source: IFAD 2004d.

Evidence shows that significant achievements have been made in improving food security and livelihoods in projects that put in place mechanisms to provide women with access to productive resources, particularly land, water, financial services and capacity-building. In Nepal, for example, a Food and Agriculture Organization of the United Nations project funded by the United Nations Population Fund focused on improving nutrition among women through increased access to irrigation water. The project worked with newly established communities of ex-bonded labourers freed under a law enforced by the Government and resettled in an area that had no access to water. People living in the new settlement had no sense of community because they had never been part of one and had no social capital. They also had no access to productive resources except a small piece of land that was allocated to them. The project helped them establish a revolving fund, provided them with treadle pumps and trained them in livestock-raising, poultry-raising and vegetable production. As a result, women were able to grow vegetables for domestic use and sell the surplus to their neighbours.

Giving women voice in decision-making for water management

Institutional reforms in the irrigation sector have been promoted worldwide since the early 1990s in response to the disappointing performance of irrigation systems, increasing competition for water among different sectors (agriculture, industrial, domestic, environment) and increasing pressure on governments to reduce their budgets as a result of changes in economic policies. The involvement of water users in the management of irrigation schemes and in operation and maintenance are a precondition to improving the performance of these schemes, as well as reducing the financial burden on governments. Greater farmer involvement in the management of irrigation schemes through irrigation management transfers and participatory irrigation management was expected to result in increased ownership of and responsibility for the systems by water users. As a consequence of the involvement of users in decision-making at the lowest level, water governance was improved.

Tens of thousands of WUAs have been created worldwide as a result of reforms to improve the management of irrigation systems, at least at the tertiary level. These WUAs are democratic bodies accountable to the stakeholders who elect the representatives. However, WUAs reflect the prevailing political and social systems of which they are a part and in which they operate. WUAs play a role in the management of local water resources and influence social dynamics and the access of poor people to productive resources, particularly land and water, but sometimes also credit. Moreover, internal power dependencies and dynamics play a significant role in the distribution of benefits among WUA members.

One of the important challenges in the organizational design of the WUAs is the identification of ways to involve women and landless people. Evidence from many countries, such as India, the Lao People's Democratic Republic, Nepal, Pakistan and Sri Lanka, shows that women's participation in WUAs is much lower than that of men. The pretext often used for excluding the participation of women in WUAs is that women do not physically irrigate fields because irrigation, by strict definition (opening and closing farmgates or field gates), is considered a man's job. However, several studies indicate a greater participation of women in irrigation activities than is often assumed (Zwarteveen 2006a).

Other reasons for the absence of women in WUAs include:

- Restrictions on the membership of WUAs
- Women's hesitation to be part of organizations dominated by men
- Lack of information available to women
- Lack of gender awareness by the project staff involved in establishing WUAs

Most by-laws restrict WUA membership to the registered landowners in a hydraulic unit who are engaged on a full time basis in farming. The registered landowners are very often men (for example, in the Near East and some parts of South Asia); even if agricultural land is registered under women's names, women are often either represented in the WUAs by their men relatives or are not represented at all. The same applies for households headed by women. In other countries (such as Bhutan, the Lao People's Democratic Republic and the United Republic of Tanzania), the membership criteria of newly established WUAs are based on labour contributions during the construction of irrigation systems or in operation and maintenance activities. When it comes to WUA membership, male relatives replace the women who take part in these activities. An exception is Bolivia, where customary arrangements allow water rights to be registered in a woman's name if she is a widow or single.

Women and men may have different priorities for water use in an area or in an irrigation scheme. While men prefer to use water to irrigate cash crops or livestock, most women prefer to use water to grow staple

BOX 3

Making participatory irrigation development beneficial for women in the United Republic of Tanzania

In the IFAD-supported Participatory Irrigation Development Programme (1997-2007) in the United Republic of Tanzania, farmers are encouraged to take responsibility for irrigation development so that schemes reflect their needs and not those of planners.

Programme activities include:

- The construction of new schemes and the rehabilitation of existing irrigation infrastructure
- Domestic water supply and sanitation facilities
- Market access roads
- Village extension services
- Farmer-managed on-farm trials and technical training for farmers and district government staff
- Credit facilities
- The general strengthening of local institutions such as WUAs

Water supply schemes are built for multiple uses besides irrigation so as to address women's concerns about water availability for domestic uses. Thus, shallow tubewell schemes have been constructed to provide water for horticultural crops, rice seedling nurseries and domestic use. This is particularly aimed at reducing workloads by reducing the time women spend fetching water for domestic use.

The programme managers have taken great care to ensure the full involvement of WUAs at each step. The programme has been successful in involving women in WUAs; in some cases, this involvement has even surpassed the ratio of men to women (70:30) in programme participation. In one scheme, women comprised a majority of the WUA membership, and WUA committee membership is shared equally between men and women. In some areas, even though plot ownership is culturally reserved for men, plot and water user-ship is dealt with in a more flexible way, which is enhanced by the focus in meetings and in the training on gender issues organized through the programme. The proportion of women with plots and membership in WUAs is over 30 per cent, and women are producing vegetables for both food and income. Women manage shallow wells and benefit from the time saved in water collection. Some have taken leadership roles in WUAs and district councils and participate in savings groups and credit associations.

A programme review in 2005 recorded improvements in household food security among the most impoverished as a result of increased crop yields. Most schemes reported average rice yields of 4 tons per hectare for the 2003-2004 season. Improved housing and more ox ploughs, ox carts, bicycles and radios are all indicators of increased wealth. Road transport costs also went down after the completion of improvements to the farm road network.

Source: IFAD 2005.

BOX 4

Encouraging women to participate in decision-making for water management in Ghana

The IFAD-supported Upper East Region Land Conservation and Smallholder Rehabilitation Project (Lacoserep, phase II) (1998-2006) encouraged the participation of landless farmers and women, who were traditionally not landowners in this region. The project adopted the following approaches:

- Membership in WUAs was not limited to farmers associated with irrigation.
- A quota of irrigated land allocation was established for women so they could obtain access to water from the irrigation schemes and become involved in decision-making processes.

The recognition of three groups of stakeholders – gardeners, livestock owners and fishers – facilitated WUA development. This also strengthened the WUAs, prevented possible conflicts over water use and facilitated watershed protection measures. The project offered substantial material incentives, including food rations and improved irrigation facilities, to all subgroups participating in rehabilitation and WUA activities.

The WUAs were put in charge of land allocation in the dam command areas and decided on the modalities for project implementation, the only condition being that plot sizes should be equal, not smaller for women, and that 40 per cent of the plots should be reserved for women.

The project conducted farmer training demonstrations based on community needs assessments and planning exercises. Farmers were trained in composting and vegetable growing, among other technologies. Of the participating farmers, 40 per cent were women.

Women were not traditionally landowners in this region, but the WUA system has given them direct access to irrigated land. As a consequence, women play a much greater role in the management of irrigation. This is apparent at meetings, where women speak up to present their own views. Women can grow vegetables more easily, generating cash and contributing to food security and improved nutrition.

Source: IFAD 2006b.

crops, food crops, vegetables, and kitchen gardens or for domestic use (drinking, washing). If irrigation projects are to address the concerns of both women and men, WUAs need to play an active role in local water management in recognizing the multiple uses of water in and around households. Greater participation by women in WUAs has been achieved in cases where membership is open to multiple users of water (not only irrigators, but also livestock owners and fishers). This is the case, for example, in the IFAD-supported small-scale dam project, the Upper East Region Land Conservation and Smallholder Rehabilitation Project in Ghana (IFAD 2006b).

More recently, policymakers have undertaken efforts to encourage women's participation in WUAs. However, women seldom join WUAs despite policy statements favouring their active membership. This may be due to women's lack of confidence in speaking up for their rights and illiteracy and social norms preventing women from taking up any public role. Where WUAs are required by law to establish a minimum quota of women, the membership is given to local elite women (in Nepal, for example, where WUAs are obliged to have a minimum of 20 per cent women members). These women are often wives of influential farmers and are unfamiliar with the problems faced by poor women.

A woman draws water from a well in the Al Aouja oasis located in Mauritania's Assaba region.

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BOX 5

Enabling women to improve their livelihoods through increased access to productive resources and knowledge in Bangladesh

The IFAD-supported Aquaculture Development Project (1998-2006) in Bangladesh promoted the long-term lease of lakes and ponds and the establishment of fish ponds close to homesteads to encourage women's participation. A total of 1,687 ponds of 225 hectares were leased by groups of women. The project supported capacity-development among fisher groups, particularly women's groups. The provision of loans and credits enabled them to buy the inputs necessary for fish production.

The project supervision report estimated that almost half of pond aquaculture groups were managed by women; some 30 per cent were managed jointly by men and women, and 25 per cent by men (UNOPS 2004). Although the women-managed groups were established in communities in which fish culture was not a regular activity among men, this still represented an institutional shift in pond management. Through their knowledge, labour, management and ownership of capital, women established an ownership right over fish. As one beneficiary said, "My husband cannot take fish from the pond; if he wants fish, he must ask me, for the fish are mine."

Although women own the fish, men still own the ponds, and a woman can lose access to ponds through divorce or abandonment. Women's access to ponds and women's use of their knowledge and capital are still mediated through the relationship of women with men either as wives or as mothers. With knowledge and continued access to capital, women can still lease a pond, as one abandoned woman did, saying, "No one can take my knowledge from me."

The project helped women to become economically independent; women are able to earn incomes, at times more so than men, and have control over this money. Before selling fish, wives and husbands usually discuss the way in which the money will be spent. Through their control over this income, women are able to spend more on household welfare, while many men tend to spend money on private consumption such as tea, cigarettes, and restaurants.

Source: UNOPS 2004.

Even if a WUA has a significant number of women members, the time allowed to speak during the meetings is greater for men than for women. In an irrigation system in Peru, half the WUA members were women, but, on average, they talked for 3.5 minutes, whereas men talked for about 28 minutes (Zwarteveen 2006a). Women took up leadership roles when they benefited from leadership training through the projects, such as for example in a project in Nepal (Empowerment of Women in Irrigation and Water Resources Management for Improved Food Security, Nutrition and Health Project) that is supported by the Food and Agriculture Organization of the United Nations and the United Nations Population Fund (FAO 2003b).

Increased participation of women in WUAs has also been observed in Bangladesh and Yemen, where efforts are being undertaken to empower rural women through the formation of women's groups, combined with the disbursement of agricultural credit (Jordans and Zwarteveen 1997; IFAD 2006b).

Capacity-development and access to information, knowledge and technology

Through their experience and responsibilities in crop production and collecting water for drinking and other domestic uses, rural women acquire good knowledge about water resources management, the sources of water and traditional ways of growing food crops. This knowledge is lost, particularly in the dual or gender-based farming systems in sub-

Saharan Africa, where irrigation projects relocate agricultural land to men farmers. This impacts on the dynamics of families by putting men in charge of land that was previously used by women. It also changes cropping patterns from low-water-demand staple and food crops to high-water-demand cash and export crops. A case in point is the Jahaly and Pacharr Smallholder Project, an IFAD-supported irrigation initiative in The Gambia.

Rural women often undervalue their knowledge and capabilities and thus do not volunteer to participate in irrigation projects, even though the projects interest them.

One of the major factors that hinders women's participation in irrigation projects is related to their low literacy, resulting in a lack of relevant skills for participation and low self-confidence. In cases where women do want to take up leadership positions, they are not allowed to do so because of prevailing social norms. In the Chhattis Mauja irrigation scheme in Nepal, for example, a woman farmer who was also a local leader of the women's wing of a political party volunteered to become a *muktiyar*, a village irrigation leader. She thought that she had gained enough organizational skills to do this because of her experience in political activities. Because of the prevailing belief that women lack negotiation skills, villagers did not accept a woman *muktiyar*; as the position required the capacity to negotiate for extra water from the main irrigation scheme. The woman *muktiyar* resigned after five months (Zwarteveen and Neupane 1996).

Relative to men, women are also often less well informed about irrigation projects. It is commonly assumed that men are heads of households and that women learn about projects and project activities through the men. Experience has shown that these assumptions are not correct. The failure to inform women about project activities and about the opportunities for women's participation is one of the reasons for the limited involvement of women in WUAs. For example, the participation of women in mixed WUAs is low when the women involved in irrigation projects are not adequately informed. An example is the Participatory Irrigation Development Programme in the United Republic of Tanzania (IFAD 2005).

Women's access to irrigation water, particularly in smallholder irrigation schemes also depends on the choice of technology and training. In cases in which women have not been trained in the appropriate use of the technologies introduced in irrigation systems, they have not benefited from water availability. In Zimbabwe, in the Chemombe irrigation scheme supported by the Department for International Development of the United Kingdom and in the Chinyamatumwa irrigation scheme supported by the Japan International Cooperation Agency, diesel pumps were introduced for water extraction. While women accounted for the majority of water users, only men were made responsible for the operation and maintenance of the pumps. The men therefore received the training, and the reliability of water availability for women thus became dependant on the presence of the trained pump operators. If pumps break down, women could not use water, and this often placed an additional burden on them because they had to carry water to ensure that crop requirements were met (Berejena, Ellis-Jones and Hasnip 1999).

Greater participation of women has been achieved in projects where project staff or non-governmental organizations have raised awareness among rural men and women. In the IFAD-supported Smallholder Irrigation and Water Use Programme in Zambia, local drama groups were used successfully in gender sensitization among rural men and women, highlighting the importance and need for women to be included in scheme management committees. The drama groups also helped in publicizing messages to communities about the establishment of WUAs. These efforts resulted in the significant participation of women in scheme management as members, as well as treasurers. While no targets were set by the project scheme management, committees had, on average, three women and five men members (IFAD 2000a).

Innovations and lessons learned

Over the past 25 years, IFAD has placed increasing importance on gender equality and women's empowerment both as objectives and as instruments for poverty reduction. IFAD considers three dimensions in its work to achieve gender equality and women's empowerment:

- Economic empowerment
- Improved well-being
- Participation in decision-making

These three pillars of IFAD's gender strategy have increasingly been providing the basis for the design of IFAD-supported irrigation and water development projects. The results have been mixed; there have been some successes and some failures. Although the processes leading to these results are not documented sufficiently, some lessons may be drawn.

New ways of doing business: Enabling women to benefit from water projects

In its programmes and projects, IFAD has tested many new ways of improving women's access to productive resources and in decision-making for water management. Based on its experience, it promotes the concept of linking land and water governance.

The goals promoted in IFAD-supported programmes and projects are to: (i) improve women's access to productive resources; (ii) enhance women's capacities to achieve the full benefits of the programmes and projects; and (iii) involve them in decision-making. These goals have been addressed through the following:

- Taking affirmative action in land allocation strategies by fixing a minimum quota for land allocations to women and equal plot size allocations for both women and men;
- Enhancing women's access to financial services through relevant mechanisms and by allocating a minimum quota of loans for women;
- Creating an environment so that landless women rice producers may permanently own land;
- Providing water infrastructure other than irrigation systems, such as wells and hand pumps, not only to address health and sanitation issues, but also to reduce the everyday drudgery of women by providing them with more time to participate in other activities;
- Establishing a minimum quota for women's membership in WUAs so as to ensure women's participation in decision-making processes;
- Setting slightly lower WUA membership fees for women, where appropriate, to make it more economically feasible for women to join;
- Opening up WUA membership to users of water for other purposes than irrigation;
- Enhancing women's capacities through training in income-generation activities, crop and vegetable production, irrigation methods, water conservation

techniques, leadership skills, literacy and numeracy;
- Revitalizing traditional knowledge in agricultural water management and crop production through training and farm demonstration plots.

There have been many successes in improving the livelihoods of rural women through the implementation of these actions; however, much still remains to be done to achieve gender equity in water management.

Involving women in water projects: What have we learned from past experience?

For most poor farmers in developing countries, land and water are inseparable: secure access to land is essential for secure access to water and to obtain the wherewithal to invest in future livelihoods. The growing water crisis may be addressed comprehensively only if the links between land and its impacts on water governance are fully recognized by all parties.

Multiple-use water projects rather than one-dimensional irrigation projects tend to address women's needs more effectively. Similarly, water and irrigation projects that include supporting elements, such as training in technical aspects, management, literacy, confidence-building, leadership skills, and easy access to financial services and loans, have a better chance of success in addressing women's concerns and involving women in project activities. This is one of the reasons women generally prefer water projects that address multiple uses rather than one-dimensional irrigation projects.

The incorporation of appropriate gender strategies and their implementation do not lead only to women's access to water and the equitable distribution of productive resources, but also improves the performance and sustainability of WUAs. However, nothing can be achieved without a clear understanding of the actual situation in the field. A thorough knowledge of social realities and gender power dynamics prior to project design, planning and implementation is required for projects. Defining and safeguarding land and water rights are needed if equity in resource allocations to men and women is to be achieved. Project design regarding the involvement of women in irrigated agriculture, other activities and WUAs needs to be based on socio-economic studies and realistic assumptions.

Building partnerships with other United Nations organizations has contributed to achieving the gender equality goals of IFAD-supported programmes and projects. For example, the World Food Programme's food for work initiative has helped several IFAD-supported projects ease the pressure on women to prepare food at home, and the time saved has been used for training. Similarly, involving non-governmental organizations and local associations in organizing women's groups has been effective. IFAD's support for institutions such as the Grameen Bank has helped women in Bangladesh to obtain the credit and access to collateral that they need to benefit fully from water projects.

Despite more than a decade of gender mainstreaming in most IFAD-supported programmes and projects, gender-sensitive project cycles are not common. A desk review of all gender support programmes in IFAD confirmed this and its findings are also relevant for water-related programmes and projects (IFAD 2006d):

- Solid gender-responsive and socio-economic design is needed to ensure that rural women benefit from project activities. Common assumptions about rural women's access to and control over resources should be avoided, and design should be based on actual situations. Also, there is a need to make a distinction between poor and non-poor women and not accept the concept of women as a monolithic category. Adequate design is needed to respond to the needs of the women who would benefit from project activities and to identify the constraints and the needs of the poorest women.

- Gender-sensitive design does not necessarily translate into gender-sensitive implementation. Poor gender equity and commitment among project staff, as well as other external factors, can turn a well-designed project into a failure. On the other side, a poorly designed project may be transformed into a successful one during implementation with a good project team and an adequate policy environment.
- Gender officers hired through programmes and projects could play a catalytic role in mainstreaming gender issues, particularly by assisting in needs assessment, the establishment of gender-sensitive monitoring and evaluation indicators, and the preparation of reports and annual workplans and budgets. Moreover, the presence of women staff members can be reassuring and become an effective tool to guarantee adequate information flow towards women in areas where women have not been accustomed to setting up certain activities.

A way forward

While there is general recognition that water plays an important role in improving the livelihoods of poor rural people, there is a need to distribute the benefits of water projects equitably to both men and women in rural societies (Zwarteveen 2006b; IFAD 2001a). Agricultural water management continues to be seen as a man's job even when women provide most of the labour in irrigated fields.

This review shows that the problems in involving women in decision-making in water management are well known and have been documented time and again. However, efforts to involve women in decision-making in water management and improve their access to productive resources have only had modest success. A minimum agenda for gender mainstreaming in water management has been proposed; it provides practical and realistic recommendations for various actors in the irrigation sector, including irrigation practitioners, policymakers, researchers, trainers and gender experts (see Both Ends and GWA 2006). The minimum agenda calls for addressing gender issues by "transforming organizational cultures and politics, and calls for a redistribution of powers, resources, and opportunities in favour of the marginalized."[2]

Securing women's access to land and water

The first step in improving livelihoods and reducing poverty among the rural poor people is to ensure that both women and men have equal access to land and water, as well as other resources such as financial services and products. More needs to be done to include women in decision-making for water management and to secure WUA membership for women who do not have land or power.

Access to water often depends on land rights or access to land use; therefore, women's access to land is crucial to their access to water. Allocating the land based on the labour inputs provided by the potential beneficiaries should ensure the equitable distribution of agricultural land to poor women.

Multiple-use water systems

Water systems that provide services for multiple uses of water are now being promoted as a potential approach for achieving the Millennium Development Goals (Van Koppen, Moriarty and Boelee 2006). While a livelihood approach is central to developing multiple-use water systems, there are technical (water sources, quality) and cost issues that need to be addressed if this approach is to work in poor rural communities.

Water may not be sufficient for all users and uses within the command area of water systems, but different sources may be used for different purposes, depending on the location of the delivery point, as well as the quality of water.

2 See http://www.iwmi.cgiar.org/assessment/Synthesis/gendermainstreaminginwatermanagement.htm.

Water quality needs to be maintained if water is to be used for human consumption, livestock and aquaculture and fishponds. Quality may also be a concern in irrigation if water is of marginal quality or contaminated, for instance because of high levels of arsenic or heavy metals.

Lastly, water systems designed for delivering services for multiple uses tend to be more expensive than single-purpose water delivery systems. However, multiple-use water systems also have a greater potential for more user commitments in operation and maintenance because they are able to provide a wide range of services to different users. The cost for designing, constructing, operating and maintaining such systems must be covered by water charges (which may be different depending on the use) and subsidies. If the actual cost of these systems is not met, the systems risk breaking down under the vicious cycle of low maintenance, bad service, low cost recovery, low budget and low maintenance. Despite the critical issues in multiple-services water systems, the systems have a great potential to improve livelihoods among poor people in rural areas, particularly rural women, if the systems are planned, designed, constructed, operated and maintained properly. The cost of these systems may even be less than anticipated if the benefits in terms of improved health and livelihoods are considered.

Mainstreaming gender for empowerment

Addressing women's concerns and mainstreaming gender in water programmes and projects through a livelihoods approach are critical because this generates an understanding of people's livelihood strategies and their decision-making mechanisms and processes.

A number of approaches have been developed over the years to facilitate gender mainstreaming in integrated water resources management.

Gender-sensitive project design and targeting

Gender-sensitive project design and targeting are needed to enable rural women to benefit fully from project activities. Project designs should be based on the actual situation at the particular site and not on commonplace assumptions regarding women's control over and access to resources. In targeting, a distinction must be made among poor rural people, rich rural elites and poor rural women in order to reach the poor women (IFAD 2006a). While setting quotas for women's membership in WUAs, project staff should take care to ensure that women who are affected by project activities and decisions made through the WUAs become members, rather than women from rich and influential families who join only because men in the families want them to do so.

Sex-disaggregated data collection and analysis

Sex-disaggregated data analysis is important throughout the project cycle in order to design solid gender-responsive interventions, to monitor implementation and to evaluate the impact of the project (GWA et al. 2006; Khosla et al. 2004). These data are key in assessing the positive or negative impacts of interventions. This review, in addition to experiences from other studies (IFAD 2006a), shows that data on interventions are not always disaggregated by sex and socio-economic population segment, making it difficult to understand the effects of the interventions on different groups, particularly women.

Gender-sensitive indicators

Gender-sensitive indicators are essential in monitoring and assessing the impact of project activities on communities of poor women and men. The indicators should be region- and site-specific and must be used in the context of the project and location. For example, indicators for a rehabilitation project in a large-scale irrigation scheme in Asia will be different from the indicators for a small well-irrigation scheme in Africa or Latin America.

However, for monitoring and impact evaluation, project-specific indicators need to be developed by the project staff in close collaboration with and based on input from the participating communities.

Gender-responsive budgets

Gender-responsive budgets and gender audits are being promoted as new gender mainstreaming initiatives (Sever 2005). These help in establishing who is benefiting from the services and interventions. If used in combination with gender-sensitive indicators, they are useful in the monitoring and evaluation of policies and programmes. Gender-sensitive indicators may be crucial in establishing criteria for budget allocations at the planning and formulation stages of interventions (Sever 2005). Sex-disaggregated data is needed to perform this analysis.

Capacity-development among stakeholders

Significant support and capacity-development efforts are required to enhance the participation of rural women in decision-making processes for water management. Training and capacity-development among women to enable them to take up leadership roles, to voice their concerns without any hesitation and to enhance their technical skills are essential if the benefits of water projects in reducing poverty and improving livelihoods are to be equitably distributed. Also, rural men need to be engaged in empowering rural women, particularly in societies where the support of men for such initiatives is required.

The capacity-development of project staff, professional women, and men engineers is as important as the capacity-development of rural women and men. The stakeholders must be aware of the benefit of a good gender approach in achieving progress in agriculture, particularly in water management. A number of sector guides and manuals for gender mainstreaming exist. However, they use social scientists' language and terminology that may not be easily understood by water professionals in the field, and are therefore not applicable in many circumstances (Zwarteveen 2006b).

Although project staff working in the field are closer to the reality on the ground and are often more gender sensitive (Both Ends and GWA 2006), the training of project staff in new approaches such as sex-disaggregated data analysis and gender-sensitive monitoring and evaluation will facilitate gender mainstreaming in water management.

Documenting and sharing existing knowledge

Documenting and sharing experiences in incorporating gender issues in IFAD-supported water programmes and projects are essential for drawing lessons on what works and what does not work in certain situations. Although there are several IFAD-supported water programmes and projects that focus on gender issues and women's involvement in projects, the experiences have not been documented sufficiently. This is particularly true regarding the process of involving women in project cycles and the related achievements and constraints. In some cases, reference to women's participation in a project is limited to the number of women beneficiaries and number of women trained. More needs to be done to document clearly the lessons learned: the successes, challenges and catalysts in successful gender mainstreaming.

Conclusions

Women's role in the management of water resources has been increasingly acknowledged by development agencies, policymakers, national governments and non-governmental organizations over the past decade. Despite this recognition of the importance of involving women, evidence shows a wide gap between the stated intentions to improve their access to water and practical results in the field. In general, the problems are well known; there is a critical need to identify solutions at different levels – policy, implementation, local – to move the agenda of gender mainstreaming in water management forward.

Gender analysis in water resources management is site and project specific, and gender-sensitive project cycles, beginning with design, are helpful in ensuring the practical and successful targeting of women beneficiaries in water projects.

IFAD's experience has shown that affirmative action can be essential to ensuring women's participation in decision-making in water management. However, programmes and projects that include supporting components such as capacity-development, access to capital and awareness-raising achieve better results in encouraging women's participation and improving their livelihoods. Moreover, multiple-use water systems tend to address women's concerns better than single-use irrigation projects.

One of the major findings of this review is that, although the problems and issues in women's participation in water management are well documented, there is insufficient information, apart from some anecdotal evidence, on successful efforts to involve women in water projects. The achievements of programmes and projects are usually described in terms of the number of women trained or the number of women beneficiaries. There is a need to document the processes that lead to the successful participation of women in the projects and how this participation actually improves the livelihoods of women. It is also important to identify the constraints faced at various levels – the policy, project, field, or community level – and how these constraints have been overcome to achieve the results.

Moreover, analysis is needed on the impact of water projects on women's workloads. This impact needs to be clearly evaluated and reported because it is often difficult to find significant information on this issue in project documents and reports.

A woman collects water at a well in Powerguda village in India. The Andhra Pradesh Participatory Tribal Development Project has constructed numerous wells, pumps and other water supply systems to provide over 76,000 tribal families with clean drinking water.

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References

Berejena, E., J. Ellis-Jones and N. Hasnip. 1999. "Gender-Sensitive Irrigation Design: An assessment of the implications of pump breakdown and community participation in irrigation schemes, Masvingo Province, Zimbabwe". Report OD 143 (Part 5), December. HR Wallingford.

Both ENDS and GWA (Gender and Water Alliance). 2006. "Comprehensive Assessment of Water Management in Agriculture". Online discussion on Gender Mainstreaming in Water Management for Agriculture CA Info Bulletin 8, 8 February. http://www.iwmi.cgiar.org/Assessment/files_new/newsroom/CABrief_Feb_2006.htm.

FAO (Food and Agriculture Organization of the United Nations). 2001. International email Conference on Irrigation Management Transfer. Organized by FAO and International Network on Participatory Irrigation Management. http://www.fao.org/AG/aGL/aglw/waterinstitutions/toconf.stm.

FAO (Food and Agriculture Organization of the United Nations). 2003a. "Dry Taps: Gender and Poverty in Water Resources Management". FAO, Rome. Eva Rathgeber.

FAO (Food and Agriculture Organization of the United Nations). 2003b. "Empowerment of Women in Irrigation and Water Resources Management for Improved Food Security, Nutrition and Health". Progress Report, RAO, Rome.

GWA (Gender and Water Alliance), UNDP (United Nations Development Programme), IRC (International Water and Sanitation Centre), CapNet (Capacity Building for Integrated Water Resources Management) and GWP (Global Water Partnership). 2006. *Resource Guide: Mainstreaming Gender in Water Management*. Version 2.1, November. GWA. http://www.genderandwater.org/page/2414.

IFAD. 2000a. "IFAD'S Gender Strengthening Programme In Eastern and Southern Africa: Field Diagnostic Study, Zambia". IFAD, Rome.

IFAD. 2000b. "Evaluación de las actividades en manejo de recursos naturales con enfoque de género en Marenass: Aproximaciones para la sistematización de un estudio de caso". Programa Regional de Capacitación en Desarrollo Rural (Procasur), IFAD, Rome. Claudia Ranaboldo.

IFAD. 2001a. *Rural Poverty Report 2001: The challenges of ending rural poverty*. Published for IFAD by Oxford University Press. IFAD, Rome.

IFAD. 2001b. *Thematic Study on Water User Associations in IFAD Projects*, Volume I: *Main Report*. Rome: Office of Evaluation, IFAD.

IFAD. 2001c. "Women's Difficult Access to Irrigation". IFAD, Rome.

IFAD. 2001d. "Assessment of Rural Poverty: Western and Central Africa". IFAD, Rome.

IFAD. 2002. "Proyecto de manejo de los recursos naturales en la Sierra Sur (Marenass), República del Perú: Evaluación preterminal". IFAD, Rome.

IFAD. 2003a. "Women as Agents of Change". Discussion paper, IFAD, Rome.

IFAD. 2003b. "Community Development Project for the Rio Gavaio Region of Bahia State, Brazil: Interim Evaluation". IFAD, Rome.

IFAD. 2004a. "Land and Water Governance Innovation Mainstreaming Initiative: Linking Land and Water Governance; Preparatory Phase". IFAD, Rome. R. Cleveringa, A. Nepveu de V., and M. Kay.

IFAD. 2004b. "Land and Water Governance Innovation Mainstreaming Initiative: Restoring Land Use through Local Water Governance and Technology in High Andes Communities, Peru". IFAD, Rome. R. Cleveringa, T. Zamalloa, and A. Nepveu de V.

IFAD. 2004c. "Focalización del Grupo Objetivo y Formas Innovadoras de Orientar los Beneficios en Comunidades Campesinas de la Sierra Peruana: El Caso del Proyecto Marenass". IFAD, Rome. Claudia Ranaboldo.

IFAD. 2004d. "Land and Water Governance Innovation Mainstreaming Initiative: Land against Labour Agreements Benefiting Women, The Gambia". IFAD, Rome. R. Cleveringa, J. Fye, and A. Nepveu de V.

IFAD. 2004e. "Improving benefits for poor, landless fishers, Bangladesh. Oxbow Lakes Small-Scale Fishermen Project (OLSFP)". Case study. IFAD, Rome.

IFAD. 2005. "Participatory Irrigation Development Programme (PIDP) in the United Republic of Tanzania: Supervision Report". IFAD, Rome.

IFAD. 2006a. "Community-Based Natural Resource Management: How knowledge is managed, disseminated and used". IFAD, Rome.

IFAD. 2006b. "Upper East Region Land Conservation and Smallholder Rehabilitation Project (Lacosrep), Phase II: Interim Evaluation Report". IFAD, Rome.

IFAD. 2006d. "People's Republic of Bangladesh: Aquaculture Development Project". Project Completion Report, Asia and Pacific Division, Programme Management Department, IFAD, Rome.

Jordans, E., and M. Zwarteveen. 1997. *A Well of One's Own: Gender Analysis of an Irrigation Program in Bangladesh*. Colombo, Sri Lanka: International Water Management Institute.

Khosla, P., C. van Wijk, J. Verhagen and V. James. 2004. "Gender and Water: Thematic Overview Paper". International Water and Sanitation Centre, Delft, the Netherlands. http://www.irc.nl/content/download/14459/194371/file/TOP12_Gender.pdf.

Molden, David, ed. 2007. *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. London: Earthscan; Colombo, Sri Lanka: International Water Management Institute. http://www.iwmi.cgiar.org/assessment/index.htm.

Saleth, M., M. Samad, D. Molden and I. Hussain. 2003. "Water, Poverty and Gender: An overview of issues and policies". *Water Policy* 5 (5-6): 385-98.

Sever, C. 2005. "Gender and Water Mainstreaming: Gender equality in water, hygiene and sanitation interventions". Swiss Agency for Development and Cooperation, Bern, Switzerland.

Sultana, F. 2002. "Gender, Class and Access to Water: Three Cases in a Poor and Crowded Delta". *Society and Natural Resources* 15, 8.

UNFPA (United Nations Population Fund). 2002. "Water: A Critical Resource". UNFPA, New York.

UNOPS (United Nations Office for Project Services). 2004. "Aquaculture Development Project". Supervision Report, UNOPS, New York.

Van Koppen, B. 1998. "Water Rights, Gender and Poverty Alleviation: Inclusion and exclusion of women and men smallholders in public irrigation infrastructure development". *Agriculture and Human Values* 15, 4: 361-74.

Van Koppen, B. 2002. "A Gender Performance Indicator for Irrigation: Concepts, tools, and applications". Research Report 59, International Water Management Institute, Colombo, Sri Lanka.

Van Koppen, B., P. Moriarty and E. Boelee. 2006. "Multiple-Use Water Services to Advance the Millennium Development Goals". Research Report 98, International Water Management Institute, Colombo, Sri Lanka.

Whitehead, A. 1998. "Gender, Poverty and Intra-Household Relations in Sub-Saharan Small Holder Households: Some Lessons from Two Case Examples". Background paper prepared for the 1998 SPA Report on Poverty and Gender in Sub-Saharan Africa, World Bank, Washington, DC.

Zwarteveen, M. 1994. "Gender Issues, Water Issues: A Gender Perspective to Irrigation Management". Working paper 32, International Irrigation Management Institute, Colombo, Sri Lanka.

Zwarteveen, M. 2006a. "Wedlock or Deadlock? Feminists' Attempts to Engage Irrigation Engineers". Ph.D. thesis, Wageningen University, Wageningen, the Netherlands.

Zwarteveen M. 2006b. "Effective Gender Mainstreaming in Water Management for Sustainable Livelihoods: From guidelines to practice". Both ENDS Working Paper, December. Project team: Domitille Vallee and David Molden (CA), Joke Muylwijk, Meena Bilgi and Pranita Udas (GWA), Annelieke Douma and Danielle Hirsch (BE).

Zwarteveen, M., and N. Neupane. 1996. "Free-Riders or Victims: Women's Non-Participation in Irrigation Management in Nepal's Chhattis Mauja Irrigation Scheme". Research Report 7, International Irrigation Management Institute, Colombo, Sri Lanka.

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