



MODULE 6

Gender Mainstreaming in Agricultural Water Management

Overview

Agriculture water management (AWM) includes irrigation and drainage, water management in rain-fed agriculture, recycled water reuse, water and land conservation, and watershed management (World Bank 2006). The approaches and technologies employed by water management projects and programs have been evolving, and change has accelerated during recent decades. The overwhelming emphasis on technical and engineering matters that was characteristic of AWM in the 1960s and 1970s has expanded outward to encompass a broader purview that incorporates social and environmental concerns. AWM is essential to food security, but it also plays a fundamental role in building human capital in rural areas. Policy and decision making regarding land and water management have traditionally been the domain of men. As a result, policies and programs do not always consider women's unique knowledge, needs, or unequal ownership rights. Women farmers need to be actively involved in the planning and implementation of land and water management programs and must be able to participate in developing the policies that affect their access and control of these resources.¹

This overview first analyzes the principal gender issues that tend to arise in AWM projects and that need to be addressed or resolved. It then presents a number of good practices based on the experience and lessons of gender-equitable AWM projects and policies. Two Thematic Notes and two Innovative Activity Profiles examine the interface between AWM and gender issues in greater detail.²

KEY GENDER ISSUES

Since the Dublin Conference in 1992, policy makers have made renewed attempts to incorporate gender issues in water development projects. 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. These disappointing results are attributable to several reasons. Policy makers and project staff often lack understanding of gender issues or of their importance. A lack of commitment and capacity to undertake gender analysis among project staff at times is evident in project design and implementation. Gender-disaggregated data are often lacking, and prevailing cultural norms can lead to serious resistance from within the affected beneficiary communities (IFAD 2007).

Women and land and water ownership and tenure. In most countries land and water rights are closely related, although water is often a public good, and therefore its use is associated with permits, concessions, and other tenure systems. Irrigated and rain-fed land is the main source of livelihood for many rural populations. Women have much less access to this essential asset than men. The distribution of this water and land is a major determinant of poverty. Even in industrial countries it is rare to have figures above 30 percent of land ownership belonging to women, and this figure tends to be much lower in developing countries. Inheritance laws that deprive women of access are often the cause. In some North African countries, women receive only half of the land or no land at all. This has been widely

documented by a survey carried out by the Centre on Housing Rights and Evictions (COHRE 2006). In some societies in sub-Saharan Africa, a woman acquires land tenure rights for life. However, this right is transferred to the men 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 (IFAD 2007).

Although proportionately fewer women own land, they may exercise many other types of tenure, such as tenant, sharecropper, or caretaker. These forms of tenure have grown more prominent with the outmigration of men. As a result there are an increasing number of women who manage farms but who do not have either *de jure* (that is, legal) or even *de facto* (that is, actual, here meaning “use”) rights to natural resources (including water) or services (for example, credit or agricultural extension) that owners have. To enable more effective participation by men and women with precarious forms of tenure, it is necessary to recognize greater relevance for these types of tenure. Project design should support the actual farm managers rather than absentees or men kin who have little interest in farm affairs. Involving the “real users” will bring efficiency gains to the project because they will be the actual persons involved in project-related activities.

Labor contribution to irrigated farms. Women made up 48 percent of the global agricultural workforce in 2000 by the Food and Agriculture Organization’s (FAO’s) estimate.³ In some African countries this proportion approaches 90 percent. It is evident that women’s labor plays a fundamental role in agriculture and in particular in irrigated agriculture. However, a number of serious problems are associated with it:

- Although an important share of farm work is informal and undertaken by family members, access to farm income and other resources depends on how the authority to make decisions is distributed among members of the household.
- Research has shown that rural women work longer hours than men but enjoy fewer benefits.
- The access of women to wage labor is often restricted. The salaries of women who do access wage work are often lower than those of men and the working hours are longer.
- Women are generally not able to irrigate at night owing to security concerns and during the day may face other time limitations. Water distribution systems rarely provide the flexibility necessary to satisfy such needs.

- When women are owners of the farm and have adequate resources to manage it, their productivity tends to be higher than or at least equal to that of men.

Decision making at the farm level. Managing an irrigated farm means making effective decisions at the right time. How decisions are made relates to a number of factors, but principally to who within the household is responsible for what decisions. Understanding how authority and responsibilities are distributed between men and women is therefore very important in interventions that seek to target specific members of the household with services such as training and technologies such as drip irrigation. Without such understanding, some of the targeted beneficiaries may not be able to participate in the planned activity because of social restrictions imposed by family members.

Participation in water user organizations. Institution capacity is an essential element of any AWM project. Irrigation management transfer (IMT) has become an integral part of many irrigation projects and requires strong institutions (see Investment Note 10.1, World Bank forthcoming). The predominant type of organization normally established is a water user association (WUA). The participation of water users in WUAs is normally linked to the ownership of the land. Because few women formally own land, their participation and representation in WUAs are normally low. Considering the substantial proportion of women who manage but do not own irrigated farms, their exclusion from associations in which they could communicate their needs and views can result in poor technical outcomes in water management, particularly for multiple uses of water.

Access of poor women and men to irrigation benefits. In addition to small farmers in irrigated areas who may improve their living standards by using local irrigation facilities, vulnerable groups exist who are deprived of land ownership and who have low educational levels. It is widely recognized that such groups are predominantly made up of women, mostly illiterate, who rarely find work to sustain themselves. Reaching them with any AWM program is a major challenge. It is feasible, however, by involving them in the consultation process and by addressing them through specific project objectives. Expansion of irrigated agriculture enhances demand for paid agricultural labor, often predominantly women.

Domestic and other uses of water. AWM projects center on the delivery of irrigation water to farms, whereas water supply projects plan only for domestic use. However, in rural life all uses tend to concentrate around the only resource available, no matter if they were planned for irrigation or

domestic use. Rural communities have diverse uses for water besides irrigated agriculture, such as fishing, livestock watering, small businesses, home gardening, and domestic tasks. Water management projects take into consideration the provision of water for different uses. The associated costs are not high if the quality of water meets the required standards, and the benefits may be significant. For instance, pipes can reduce the time required for unproductive activities such as fetching water from far distances. For instance, UNFPA (2002) estimated that women in many developing countries walk an average of 6 kilometers a day to collect water. The availability of clean water close to home saves women's and girls' time, which can be spent on other productive and human development activities, such as crop production and education (IFAD 2007).

Water quality also requires particular attention in this context. In many irrigation systems water for domestic use is taken from canals. The situation is even more difficult in areas in which nontreated wastewater is used for irrigation and the health risks are high. Understanding water quality is important not only for women but also for the whole household because family health depends upon it. Planning projects for multipurpose uses requires a thorough investigation of the nonagricultural uses and in particular of women's needs.

LESSONS LEARNED

This section discusses the lessons learned at both the project and the policy levels.

Project level

Four main issues should be considered in project planning and implementation of gender-sensitive approaches to agricultural water management:

- Genuine gender-sensitive participatory project planning and implementation will prevent elites from capturing most project benefits. The benefits will therefore extend to a much larger population base. The experience of Nepal shows that this approach is feasible and renders positive returns of women's participation (see Investment Note 10.4, World Bank forthcoming).
- Water projects should be designed to address women's and men's domestic and productive water needs. To date, many single-sector projects have been planned, for either irrigation or domestic water supply, and multiple-use needs had requirements that have been overlooked, causing particular difficulties in rural areas.

- Planners should include among project objectives specific reference to increasing women's capacity to participate in irrigation projects and plan for ways to increase their access to productive resources.
- Project planners need to have a better understanding of the social, economic, and institutional reality of the project area. In practical terms, this means that some modest incremental resources should be allocated for assessment of such realities, particularly during the planning stage.

As the points above suggest, intersectoral linkages are key in seeking gender-positive outcomes. The following specific suggestions may assist concerned planners and implementing staff:

Land tenure. Irrigation development projects often include land titling components. Opportunity exists here for expansion of women's asset base provided that new land titles are granted to women or to husbands and wives jointly, depending on the prevailing socioagricultural context. Understanding the social organization of agricultural production and the specific gender division of labor in the project area requires a thorough investigation into the gender aspects of land tenure, including the use of participatory investigations and gender-disaggregated land surveys. Land reclamation projects in particular can do much to increase women's access to and control over land. The approach used in the LADEP project (see Innovative Activity Profile 2) and the LACOSEREP project (see Innovative Activity Profile 1) provides good examples of how to overcome gender issues in land projects.

Gender division of labor. Awareness of women's sizable contributions to farm and household production is lacking among project planners. Farm models used in project design should carefully evaluate the availability of women's and men's work in the family and expected impacts of intervention on women's and men's income, time use, and social power. Labor contribution by project beneficiaries to the construction component in small projects can be very significant and reduce costs (see Investment Note 10.1, World Bank forthcoming). Few types of construction cannot be carried out by women if they are provided with suitable tools and guidance. Here again, this requires good knowledge of the available labor force (men and women) and of local traditions.

Water user organizations and other institutional arrangements. Because women are poorly represented in WUAs, careful attention is required to devise innovative ways of ensuring women's and poor men's meaningful participation in such forums. Sometimes the by-laws of an association

may provide equal opportunities for all members, but then discriminatory practices are applied, leading to low participation. More often, however, the criteria for WUA membership themselves are exclusionary and primarily focused on land-holding status, meaning that women and tenants are often left out. Overcoming this difficulty represents a challenge that has been successfully addressed by some projects. Approaches for tackling this issue have included the following:

Quota systems wherein a minimum number of board seats are reserved for women. This positive discrimination can increase women's participation, though quotas have also backfired in other places or been "captured" by women put up to the position by dominant men. This has also led to a focus on increasing women's participation among membership ranks as well as leadership, so that a "critical mass" of women develops. Stalker (2004) examined data from 45 villages in two World Bank–assisted projects in India and came to interesting conclusions regarding women's participation in water user committees in the domestic water supply sector. Although, in some cases, women committee members were nominal, or token, participants, evidence showed that being on a local water committee helps women develop skills and confidence.

Gender-inclusive WUAs developed by removing exclusionary membership criteria regarding land ownership. This took place in the IFAD-supported LACOSEREP project in Ghana (see Innovative Activity Profile 1) in which membership to WUAs was not limited to farmers associated with irrigation and, by doing so, opened up the opportunity to get women involved. Much depends here on how "farmer" is defined, for example, not just "irrigators" applying water to the field, which may be a man's task in many places, but also other farmers, such as those doing weeding, transplanting, harvesting, and other tasks, who are often women, and beyond crop production, those farmers using water for livestock production and other uses (often women).

Where WUAs are strictly associated with formal (often large-scale) surface irrigation systems, scope also exists to establish other water user groups at the community level that represent women's needs and interests, provided they link up formally to the WUAs so that multiple use needs are discussed. Examples of such associations are cooperatives in which membership is not limited just to owners of land but to any type of tenure. Such associations may take the place of a traditional WUA or work in parallel with them.

Recognizing organizational pluralism with various groups set up to respond to different needs is important. Turkey's Irrigation Management Transfer Programme illustrates very clearly that the management responsibility of

irrigation systems can be performed by several types of organizations besides the traditional WUA model such as water cooperatives, village organizations, and municipal organizations. The important principle, again, is that larger institutional analyses and strategic forms of formal collaboration take place so that subvillage/water-point level groups, for example, are not marginalized in local planning processes for water management. The IFAD-supported LACOSEREP Project (see Innovative Activity Profile 1) illustrates a nontraditional WUA model that integrates three groups of predominant stakeholders: gardeners, livestock owners, and fishermen. The main WUA was defined as a combination of these subgroups, with an executive body comprising members from each of the three subassociations. Another interesting feature of this association was that members were put in charge and the modalities of this procedure were left to members to decide, the only condition being that plot sizes should be equal, not smaller, for women, and 40 percent should be reserved for women. The small number of women extension officers is often cited as a weak link to channeling information and knowledge to women. To change this situation, training courses for mainstreaming gender dimensions in the daily work of extension staff can be done and are effective. Many training manuals (GWA and Both ENDS 2006; Sagardoy and Hamdy 2005) and related material undertake such training courses.⁴

Designing and implementing multiple use water services. The water requirements necessary to satisfy domestic needs are a small fraction of those applied to agriculture production—usually less than 6 percent. Such small requirements rarely create conflict in terms of quantity with irrigation needs. The problems are generally posed by the quality, but proper water treatment and filtering plants provide satisfactory solutions in most cases. Thus, the question of implementing a system that satisfies the domestic water needs is essentially associated with the related costs of the system (treatment plant and water delivery) and the ability of the farmers to pay for this service. In rural areas, where houses may be erratically distributed over the land, it may not be feasible to provide them with tap water, and communal watering points may be the best solution. As women will be the main users of those watering points, planners must understand their water needs and associate them with the management of such watering point sites. A strong consultation process should take place during the planning and implementation stages, but training programs addressed to women to help them manage and maintain the points of supply will also be necessary. Implementing multiple water use projects can introduce an additional cost factor and

institutional complexity in the management of the nonagricultural uses. However, the efficiency gains at the national level are much greater than if the provision of these services is done separately or not done at all (see Thematic Note 1 for details).

Reaching the poorest and most vulnerable groups. The importance of including vulnerable and often-overlooked groups such as landless workers and poor women farmers is increasingly understood but is not always included in project design. Including them in the projects means that the greatest unexploited potential to influence land and water use management will be tapped positively.

The first questions to answer are as follows: Who are the poor? How do they secure their livelihoods? Often the rural poor are women, men, and children owning little or no land and without other significant nonagricultural income. Poverty impacts of irrigation projects can include increases in demand for both agricultural labor and direct project construction, as well as the possibility of land transfers through watershed development and land reclamation efforts.

Monitoring and evaluation. Monitoring the progress made in applying gender approaches in irrigation projects is seldom undertaken. The development of gender indicators in the context of project implementation is an area that lags behind (Sagardoy and others 2007). Progress is evident, however, and a variety of gender indicators related to water are being developed by FAO and other organizations. Investment Note 10.4 (World Bank forthcoming) provides further guidance on this issue.

Policy level

The effectiveness of AWM programs is heavily affected by government policies for the sector and related sectors. Understanding government policies, the institutional environment from whence they are generated, and the priorities they reflect is an important element in designing projects that are more likely to receive support from the government.

The development community at times can have considerable leverage in promoting changes in policy. Gender issues that require active policy support include the following:

- Ensure that women enjoy de jure and de facto equality in access to land and other property, including inheritance and purchase.
- Support pro-poor development actions. Investment Note 10.3 (World Bank forthcoming) provides more detailed orientations in the interrelation between poverty-gender issues and AWM policies. The example of South Africa illustrates a relevant policy in this respect.
- Promote the participation of women in WUAs and other organizations by supporting appropriate institutional measures, such as minimum quotas, or allowing that other forms of tenure besides ownership be eligible for being a member in the association.
- Provide an equal opportunity legal framework for agricultural laborers (and others) and ensure its application, including support for gender-equitable wages.
- Provide improved coordination among concerned WUAs to facilitate the implementation of multiple-use water projects.
- Support equal employment opportunities in WUAs.
- Provide and support capacity building around gender issues in WUAs with particular attention to extension staff. The establishment of dedicated government offices to monitor gender progress and provide specialized training, technical assistance, and sometimes modest financial incentives can be most effective in providing more opportunities for women.

Some indicators to monitor the gender impact of activities in agricultural water management are provided in table 6.1.

Depending on the country or region, it may be relevant to also consider ethnicity and caste alongside gender (both as comparative indicators and when collecting data), as women of lower castes or ethnic minorities are usually in the worst situation.

Table 6.1 Monitoring and Evaluation Indicators for Gender in Agricultural Water Management

Indicator	Sources of verification and tools
Number and frequency of women, men, and other disadvantaged persons consulted during detailed design and implementation	<ul style="list-style-type: none"> • Community meeting minutes and records of prioritization and votes
Percentage of women and men actively participating in planning sessions for water allocation program for drinking water and agricultural irrigation	<ul style="list-style-type: none"> • Meeting minutes • Technical plans indicating water uses and timetable
Percentage of women and men actively participating in water user groups	<ul style="list-style-type: none"> • Case studies • Meeting minutes or administrative records
By year <i>x</i> of project operation, operational costs are covered with user fees and maintenance fees collected to agreed level	<ul style="list-style-type: none"> • Bank account records • Women's user group records
Percentage of women and men members of operations and management committees of irrigation projects	<ul style="list-style-type: none"> • Meeting minutes
Women, men, and ethnic minorities in positions of management or leadership in water user groups	<ul style="list-style-type: none"> • Meeting minutes • Women's user group committee records
Community satisfaction (disaggregated by gender) regarding water distribution schedules and access	<ul style="list-style-type: none"> • Focus groups • Interviews, before and after
<i>x</i> percent of women and men among total trainees receiving training in the appropriate use of irrigation for high-value crop production	<ul style="list-style-type: none"> • Training records
Access of women and men to support services, such as credit and extension (such as percentage of women in agricultural training and of women clients of credit institutions)	<ul style="list-style-type: none"> • Extension department records • Interviews with women in target groups
Access of landless women and men to water from irrigation schemes	<ul style="list-style-type: none"> • Community meeting minutes
Among surveyed women in target group, <i>x</i> percent rate their access to water for agricultural and domestic use as having improved during the period covered by the program or project	<ul style="list-style-type: none"> • Interviews with women in target groups (for instance, a sample of women in the defined area); ideally the interviews should be conducted before and after any project or program activities
Changes in relevant dimensions of well-being, disaggregated by gender and wealth group: food and other products, household income, labor and other costs for water conveyance, water quality for drinking, and water quantity for hygiene	<ul style="list-style-type: none"> • Household surveys • Water quality testing by project or local environment department

Source: Inputs from Pamela White, author of Module 16.

Gender and Multiple-Use Water Services

Multiple-use water services in poor rural and peri-urban areas are a highly effective way to use water to reduce poverty and enhance gender equity. By taking women's and men's multiple water needs as the starting point and accessing multiple sources of water in an integrated way, multiple-use water services meet a broad range of dimensions of well-being, enhance project sustainability and willingness and ability to pay, and foster more equitable water management.

It is well acknowledged that water resources are interconnected within one hydrological cycle, encompassing naturally available water resources: rainfall, groundwater, surface lakes and streams, ponds, springs, wetlands, and water and human-made storage, reservoirs, conveyance canals, pumps, reticulation networks, abstractions, and take-off points for end uses, drains, return flows, and groundwater recharge. Water from multiple and conjunctive sources is used and reused to meet multiple needs. In the past the focus has largely been at the higher aggregate basin and sub-basin levels. However, multiple-use water services approaches recognize that integrated water resources management starts within the household, especially in poor rural and periurban areas where livelihoods are highly water dependent and diversified.

Women and men tap, convey, and use water for drinking, other domestic purposes, livestock, gardening, irrigation, tree growing, fisheries, food processing and other small businesses, and cultural purposes. Multiple water sources are used simultaneously, depending on their comparative suitability for certain uses (easy accessibility, year-round availability, site, quality, or predictability). For example, more reliable, year-round, and higher-quality sources are prioritized for domestic uses; roof water and runoff are used during the rainy season; slightly organically polluted water is used for irrigation.

Multiple-use water services approaches overcome the barriers created by the way in which the water sector has

structured itself. Organization was typically based around single-use sectors: a domestic sector, an irrigation sector, a fisheries sector, a livestock sector, and others. These organograms fail to fit the nature of water resources and people's multiple water needs. Conventionally, the irrigation sector, for example, prioritized productive water uses by adopting that as its mandate, even if domestic, livestock, and other more urgent water needs of their clients were not satisfied. In reality, however, users anywhere in the world made the match: they transformed single-use planned systems into de facto multiple-use systems. In response to that observation, the irrigation sector developed an "irrigation-plus" approach, for example, by adding washing steps, entry points for cattle, or special abstractions and reservoirs for domestic and livestock water supplies, especially in the dry season (box 6.1).

Usually these adaptations were seen as "add-ons" and less important than the primary mandate of water for crops. Taking people's priority water needs as the starting point instead of beginning with a bureaucratic mandate matches realities on the ground even better.

INVESTMENT AREA

Multiple-use water services bring gender to the center stage of water development, use, and management. In the past women's needs, either as providers for domestic water or as producers in their own right, were often ignored in agricultural water management projects. Yet their de facto uses of "irrigation water" for nonirrigation purposes were in reality often the most important benefit for women (Hussain 2005). Women are nowadays better recognized as producers on an equal footing with men, but irrigation and rural livelihood-oriented development investments still tend to ignore women's domestic and other water needs.

Men's responsibilities for domestic water provision, a crucial aspect of household welfare, are even more ignored.

Box 6.1 Pakistan: Socioeconomic Differences in Access to Water for Livestock Watering

An International Water Management Institute study in Pakistan found that socioeconomic level affected households' access to water for livestock watering. Better-off households living on larger properties were able to keep their animals in stalls on their home compound and bathed and watered the animals with the same domestic water the family used (that is, groundwater from hand pumps, motor pumps, and wells).

Ninety-five percent of respondents from such households found water sources sufficient for their animals. In contrast, poorer households (and those few households who lived near their fields farther from the village) had to drive their animals to canal watercourses and distributaries for watering and bathing. Only 71 percent of such respondents found such water access arrangements satisfactory.

Further, livestock use of canal water is illegal and pollutes the distributory water for downstream domestic users. The traditional livestock pond held in common in each village is now being degraded by release of wastewater and sewage from those households with private sources of water.

Source: Kuriakose, Jehangir, and ul-Hassan forthcoming.

Although the daily drudgery of fetching water is the typical gendered burden for women and girls, and to a lesser extent for boys, in many societies men do take part. Men can take the responsibility for the construction and maintenance of wells or ponds or for transport if aided by donkeys, bicycles, or cars. Domestic water provision by both women and men should be further recognized as a critical factor for household welfare from rural households and communities to national and international policy discourse. This reflects the notion of equality of men and women both in carrying out the unpaid tasks for household welfare and in generating income for the family's benefit.

Multiple-use water services also allow for pro-poor water allocation, based on a quantitative understanding of the distribution of water uses across various levels. If poverty is understood as a state of multidimensional deprivation in which basic needs are by definition broadly defined, it is an anomaly to confine "basic" water needs to one purpose only: drinking and personal hygiene. Food and income are

as critical for poor households to mitigate malnutrition and income poverty as domestic water is for drinking, hygiene, and cooking. Providing for both domestic and small-scale productive uses is estimated to require water quantities in the range of 50–200 liters per person per day (Butterworth and others 2003). Thus, in poor rural and periurban areas, such water uses all directly contribute to poverty alleviation. These quantities are minimal from the overall resource perspective from the local to the basin level and fall within the errors of hydrological models. The irrigation sector also has viewed the quantities needed for domestic uses as negligible.

BENEFITS FROM GENDER-RESPONSIVE ACTIONS

In productive-plus designs, domestic water provision is a matter of year-round provision as near as possible to the place of consumption, as is water quality for the even smaller quantities of two to four liters per person per day, depending on climate (Howard and Bartram 2003). Integrating livestock needs in irrigation design is not a quantity issue either, but a matter of protection against cattle destroying canals, soils, and crops and polluting resources. Therefore, quantities of water for such vital livelihoods hardly ever encounter environmental constraints, except perhaps in the dry seasons in areas where storage and other infrastructure development levels and natural endowments are low. The key problem is the distribution of water use among people, which can be highly skewed. This is illustrated by the Gini coefficient for water use distribution in South Africa, which was found to indicate near total inequality of 0.96 (see box 6.2).

In the domestic sector, the recognition of multiple water needs has gone along remarkably similar lines. Starting from the single-use mandate to provide water for domestic uses only and observing the reality that all "domestic" schemes are de facto used for multiple purposes, some organizations started adopting a "domestic-plus" approach. For example, they augmented the discharge of the water supply systems to allow for watering livestock and gardens also and for home-based enterprises, or they connected cattle troughs to drinking water supplies.

Some technologies, such as rainwater harvesting and wells for single or small household groups, allow for multiple uses in design. Instead of addressing drinking water quality through centralized water treatment facilities, point-of-use treatment (filtration, chemicals) has expanded significantly. This not only mitigates the inevitable pollution of domestic water projects during conveyance and

Box 6.2 South Africa: Inequitable Water Distribution in the Olifants Basin—Options for Redress

The colonial history of South Africa left a legacy of a highly skewed distribution of water resources. In the Olifants basin, the Gini coefficient for (blue) rural water uses (which constitutes 91 percent of all water uses) is 0.96. In other words, 0.5 percent of the rural population controls the access to 95 percent of the blue water resources. If the majority of the population were to double their current water use, the few large users would have to share only 6 percent of what they use now. Underlying this so-called environmental crisis in this basin, where by now most physical water resources have already been committed, is the highly inequitable socioeconomic and political distribution of water resources, which requires a redistributive water allocation reform, such as that recently launched by the government of South Africa.

Sources: Cullis and van Koppen 2005; RSA 2005.

household storage but can also solve water quality problems in “productive-plus” water services. Moreover, point-of-use treatment also applies to the millions of households that are not served by any public project. A clear example of the growing recognition of the importance of multiple-use services is the World Bank’s Water and Sanitation Program. The program’s vision to integrate multiple-use services fully in their approaches can be compared with the way in which sanitation has been integrated in “domestic” supplies since the 1980s.¹

The growing dialogue between the productive and domestic water sectors to develop jointly “multiple water use services by design” integrates water services where it matters for poverty alleviation and gender equity. “It is Integrated Water Resources Management that directly advances the Millennium Development Goals. . . . As the water professionals created the barriers between them, it is the water professionals who have to break them down.”²

Health impacts of a multiple-use approach

Health is also improved from multiple-use water services. In spite of strong concerns by the health and domestic water sector departments about the quality of drinking water in

“productive” schemes, many planners have realized that in areas without any domestic water supplies, the use of irrigation water for drinking purposes was an improvement over the status quo. Moreover, in the many situations in which groundwater and even surface streams are used, water quality is acceptable for domestic uses other than drinking, and in specific cases, also for drinking. Later studies confirmed that regardless of its sometimes questionable quality, the availability of any additional *quantities* of water has a beneficial impact on people’s health (Esrey and others 1991; Howard and Bartram 2003; Jensen and others 2001; Van der Hoek and others 2001), especially when combined with improved hygiene behavior. Hence, within reason, water quantity is more important than water quality, and other alternatives such as various point-of-use treatments exist for the small quantities needed for actual drinking. (It should be noted, however, that for small children poor quality water remains a major risk for diarrhea; see Clasen and Cairncross 2004; Hebert 1985.)

Point-of-use treatment is increasingly seen as a more appropriate option in the domestic sector (Mahfouz and others 1995; Mintz, Reiff, and Tauxe 1995; Quick and others 1999, 2002; Reller and others 2003; Roberts 2003), particularly in dispersed or difficult-to-reach areas. Such treatment also solves the water quality concern for productive-plus schemes and, moreover, for the millions who have no access to public supplies, such as those using groundwater wells that may be contaminated with arsenic or fluoride.

KEY GENDER ISSUES

Past evidence of domestic-plus, productive-plus, and multiple-use by design approaches highlights three sets of benefits of water services that take poor women’s and men’s multiple water needs as the starting point.

Improving more dimensions of women’s and men’s well-being

Various simultaneous water uses provide a broad range of benefits: food production (crops, livestock, fish), income (from the sale of primary products and water-dependent artisanal businesses), reduced drudgery of water fetching, and enhanced health. These different benefits tend to reinforce each other into a virtuous circle out of poverty.

Women benefit in particular from dissolving the dichotomy between the domestic and productive spheres and approaches that take women’s and men’s water needs as equally important by design. In this way, the “productive”

sectors also better recognize the priority need to alleviate the unpaid chores of women and girls for domestic water fetching, as well as the burdens of men and especially boys to take care of cattle watering at distant sources. Second, the starting point at which women are producers in need of water on an equal footing with men is effectively operationalized by stimulating productive activities around the household. In societies in which women's mobility is limited or in which women lack access to fields of their own, a situation similar to the situation of land-poor and landless households in general, homestead production offers unique opportunities for income generation. A study in Nepal confirmed how women in particular benefited from the newly installed domestic-cum-gardening water supplies and drip irrigation kits around the households (Upadhyah Samad, and Giordano 2005).

Enhancing project sustainability

Multiple-use water services enhance project sustainability in various ways. First, anticipating future “unplanned” uses prevents the problems of de facto multiple-use programs, such as damage to infrastructure, the distortion of allocations because of upstream overuse of domestic programs designed for minimum uses only, or “illegal” connections. Second, new local water management institutions for investing in and operating and maintaining new infrastructure can be grafted onto communities' existing water arrangements. The latter are invariably integrated for multiple uses and holistically govern the same water resources used by the same people. The smooth continuum between existing arrangements and new institutional elements strengthens community ownership. They also avoid the turf wars between newly imposed “domestic” WUAs and “irrigation” committees. Third, the willingness to contribute to managing new projects sustainably is higher if the programs better meet users' needs. The ability to pay for the project is enhanced by better water delivery for productive activities.

Using water more equitably

From local to basin level, the simultaneous consideration of all water uses and everybody's needs gives a human face to water development and regulation. Formal water resource allocations tend to be based on sectors, with the domestic water sector as a first priority, and agriculture, environmental needs, industrial needs, and others as the next priorities. However, this ignores the huge differences in water use

within sectors. Pro-poor and people-based allocation prioritizes all uses of water for domestic and productive needs that allow every citizen to reach at least minimum standards of well-being. Only after expanding and protecting those uses are remaining water and other resources allocated.

Keeping incremental technology costs low or none

The above-mentioned benefits come at limited incremental technology costs and even come at no incremental cost in the case of de facto multiple-use schemes. Technologies that allow for multiple uses by design reassemble the conventional technology components into a more user-friendly package. This is a matter of basic rural engineering skills, not of hardware costs per se. However, the costs that tend to increase most are the transaction costs in the early planning and design stage. A process in which women and men articulate their priority needs, which then are translated into an optimal technical and institutional design, takes time and facilitation.

POLICY AND IMPLEMENTATION ISSUES

The key actors in shifting from single-use water services to multiple-use services are national and international governmental and nongovernmental agencies. They shape the internal structuring and financing of water sector policy making, implementation, and vocational training and tertiary education. Policies and legal frameworks tend to define overall policy goals in terms of single-use water development and to set standards and quality norms, for example, for drinking water, assuming that single use is the priority use, if not the only use, of the beneficiaries of a particular program. Financing streams are also typically earmarked for one single use. Organizationally, departments are structured according to single-use mandates. In a top-down manner those mandates trickle down to lower-tier branches through job descriptions, performance evaluations, monitoring systems, technical expertise, and other ways.

These policies and legal constraints need to be transformed. In each sector sectoral mandates that are too narrow are to be expanded into multiple-use mandates. Constraining norms and standards must follow. For example, imposing unrealistically high water quality standards is now recognized to be of little use in a search for incremental improvements to deal with health hazards. The World Health Organization recently also changed its focus from fixed water quality standards to more flexible guidelines (WHO 2004).

Besides formulating and promulgating enabling policy and legal frameworks, national-level stakeholders also need to establish meaningful coordination across sectors and actors. This implies, in essence, devolution of decision-making regarding water services to the lowest appropriate level, up to clients' multiple water needs in their integrated diversified livelihoods. Bottom-up needs-based design requires poor water users to decide on the services they need. It is true that national or regional agencies will keep a role in large-scale dams and other large- or perhaps medium-scale water works and basin-level regulation. However, beyond that, national governments have a main role to play in supporting intermediate-level water services providers (local government, local nongovernmental organizations [NGOs], private water service providers, and others), so that they are enabled, in their turn, to coordinate the support for communities according to integrated needs emerging from transparent and participatory design procedures for multiple-use water services.

Long-term support by national and intermediate-level stakeholders to communities is also required for multiple-use services at any significant scale. This support is financial, institutional, and technical. Considerable financial support earmarked for multiple uses is critical for any taking multiple-use water services to scale and reaching the Millennium Development Goals. Subsidization will remain necessary for reaching the poor for decades to come. Yet cost recovery by those who can pay and earn an income from multiple-use systems should be tied into programs. National support is also needed for institution building and expanding the choice of affordable and appropriate technologies for multiple uses.

For the factual implementation of multiple-use water services, intermediate development agencies, in particular local government and other administrative structures, are pivotal, irrespective of any basin boundary. Yet Integrated Water and Resources Management institutional structures at basin or aquifer levels can strengthen cross-sectoral coordination. In fully committed basins, basin institutional arrangements would enforce water allocation that prioritizes basic domestic and productive water needs.

GOOD PRACTICES AND LESSONS LEARNED

The concept of multiple-use water services emerged in the domestic and productive water sectors alike, in response to the major lesson learned: planning and design of water services for one single use do not fit clients' needs in poor rural and periurban areas. Even productive-plus and domestic-plus

approaches reproduce an implicit prioritization of water uses according to top-down defined mandates. Clients have always expressed these needs by simply transforming single-use planned systems into de facto multiple-use systems. Not surprisingly, multiple-use services tend to resonate immediately with communities and with any water professional with field experience.

In the past decade, NGOs (for example, AWARD, Catholic Relief Services, Mvuramanzi Trust Zimbabwe, Plan International, South Africa) and small-scale private sector projects (for example, Agua Tuya in Bolivia, rope pump development in Nicaragua) with a client-oriented poverty and livelihood focus swiftly started applying multiple-use water services approaches. Their mandates and internal structuring allowed them to just do it.

International research programs, in particular the Challenge Program on Water and Food of the Consultative Group of International Agricultural Research, is conducting global- and basin-level research projects on multiple water uses. International financing agencies, such as the World Bank, are also adopting multiple-use water services approaches. Wherever the political will exists, national governments have also started recognizing multiple-use services approaches. For example, the South African Department of Water Affairs and Forestry recently embarked on this road. In Colombia rural development agencies coordinate with the national government, among others, on the need for augmenting the quantity norms for rural water supplies.³

Early experiences also highlighted that the most challenging level is the intermediate level of service providers and WUAs. Stakeholders at this level together and in a coordinated way are to provide sustained support to investments and construction of multiple-use projects in their zone of intervention, as well as to "after care" by supporting operation and maintenance. Today, however, agencies such as local government or district irrigation agencies are typically under-sourced, lack capacities, are "trapped" in ad hoc planning and trouble shooting, and divert their attention to a few "islands of success in oceans of misery." Although accountable in name to their constituencies, local officials formally report upwards to a range of typically uncoordinated bureaucracies.

Multiple-use water services are a particular form of decentralization, and their successful implementation depends upon the success of decentralization in general. Yet the main lesson of irrigation management transfer and other forms of decentralization until now is that a mere devolvement of responsibilities without the corresponding resources required to fulfill these responsibilities is bound to lead to the collapse of even the small support

that previously existed (Shah and others 2002). Therefore, the most needed lessons will come from recent initiatives like the World Bank's Community Driven Development approach (Binswanger and Tuu-Van Nguyen 2005) or pilot experiments to integrate multiple-use water services into local government planning, for example, in South Africa's Integrated Development Plans (Maluleke and others 2005).

GUIDELINES AND RECOMMENDATIONS FOR PRACTITIONERS

The following recommendations apply to practitioners at the three levels (Van Koppen, Moriarty, and Boelee 2006).

At the national level:

- *Enabling policy and legislative framework.* Remove the obstacles for multiple-use water services, such as a narrow focus on one single water use only in mandates, financing streams, or standards and norms, and, instead, prioritize water development and water allocation for poor women's and men's concurrent basic domestic and productive needs.
- *Financing.* Allocate subsidies and loans to communities and to intermediate-level stakeholders for upscaling of multiple-use water services.
- *Coordination across sectors and actors.* Decentralize decision making for development to the lowest appropriate levels and shape national support according to those integrated needs.
- *Long-term institutional and technical support.* Facilitate inclusive institutional design for community-based integrated water resources management and capacity building and development and disseminate appropriate and affordable technologies and skills for multiple uses.

At the intermediate level:

- *Adaptive management.* Stimulate adaptive learning-by-doing by intermediate-level stakeholders to gradually move toward water services provision for multiple uses across increasing numbers of villages.
- *Strategic and participatory planning.* Develop transparent methodologies across a region that allow for water services planning and design based on communities' articulated multiple water needs.
- *Coordination across sectors and actors.* Organize holistic support to communities based on integrated water and livelihood needs.

- *Financing.* Establish sustainable investments and revenue collection mechanisms both for community-based schemes and water user associations and for intermediate-level support structures.
- *Long-term institutional and technical support.* Provide support to communities for community-based institution building and for a wide choice of appropriate and affordable technologies.

At the local level:

- *Livelihoods-based planning and design.* Facilitate an inclusive planning and design process in which women and men articulate their domestic water needs as shared responsibilities for household welfare and their respective productive water needs as equal opportunities for improved livelihoods.
- *Appropriate technologies.* Translate multiple water needs into affordable small- and medium-scale technical designs, in particular storage for year-round water provision.
- *Sustainable water use.* Tap synergies for more efficient water use by combining multiple sources for "more use and reuse per drop," prioritizing basic domestic and productive water needs in periods and sites of scarcity.
- *Inclusive institutions.* Graft new integrated water management institutions upon existing community-based water arrangements that already holistically govern shared water resources for multiple uses.
- *Financing.* Establish sustainable cost-recovery mechanisms at the local level, while providing smart subsidies for those who cannot afford to pay.

Project preparation

The following questions guide the preparation of projects for multiple-use water services across the various levels:

- Are project goals, mandates, and evaluation criteria constraining toward one single water use, or do they acknowledge people's multiple water needs? If constraining, what short-term strategies can be deployed to widen the mandate (such as pilot projects with intensive monitoring)? Which strategies are needed in the long term, and how can they be initiated (such as research to reexamine national standards)?
- Are technical experts in the projects sufficiently aware of clients' water needs outside their immediate focus? Are they encouraged to look outside the disciplinary box?

- Which participatory process is foreseen that allows the target group of poor women and men to express their water needs at the very beginning of a project, to identify affordable technologies, to sustainably tap multiple water sources, to design inclusive new institutions on the basis of existing water arrangements, and to establish sustainable financing mechanisms while supporting the poor and the poorest? What are the incremental costs of such a process?
- How are women's and men's mutual domestic labor and monetary responsibilities articulated and translated into the technical and institutional design?
- How are women's and men's equal needs for water for productive use considered and translated into the technical and institutional design? Which additional support is required for both women and men to make more productive use of water?
- Which incremental health benefits can be achieved for the microquantities of drinking water and for other health dimensions of water services?
- How will the capacity of the intermediate-level service providers be built to continue support to target communities and to replicate lessons learned in other communities?

Projects with a multiple-use water services focus can include the following monitoring and evaluation indicators:

- Changes in relevant dimensions of well-being by gender and wealth group: food and other products, income, reduced labor, and other costs for water conveyance, water quality for drinking, and water quantity for hygiene
- Participatory planning and design process that allows for bottom-up needs definition by women and men and articulation of gendered needs for external support
- Level of cost recovery
- Technical innovations allowing for multiple uses
- Capacity building of intermediate-level service providers to apply needs-based multiple-use water services on a larger scale
- Removal of current barriers to multiple-use water services in national policy and legislative frameworks.

Gender and Institutional Approaches to Groundwater Development and Management

Gender-sensitive approaches to groundwater development and management help secure and protect groundwater access and use for women and the rural poor. Gendered water rights determine access and control over groundwater resources. Men and women differ in their needs and technological preferences for groundwater extraction and are affected differently when groundwater development interventions are introduced. Gender analysis should thus be undertaken throughout the project cycle. Only when the needs and preference of all users are taken into account can the project objectives of poverty reduction be attained.

Recognition of gender issues in the use and management of the groundwater resource is vital to realizing the project objectives of poverty reduction and sustainable management of the resource. Groundwater has certain characteristics that make it different from surface sources. Groundwater, available in deep and shallow aquifers, provides security against drought by offering a reliable year-round natural storage of relatively good-quality water, close to the point of use, usually at a lower cost of development. It has been a crucial resource in livelihood creation programs in different parts of Asia and Africa through intervention in both deep and shallow groundwater projects. The unique characteristics of groundwater have made the provision of its services for drinking, irrigation, and other productive purposes an effective way to reduce poverty and enhance gender equity.

Investment in a gender-sensitive institutional approach to groundwater development and management brings user-preference issues to the fore and is a key part of planning for sustainable water use systems. Gender inequalities in access to and control over groundwater abound. This Note examines issues regarding access to groundwater abstraction technology and use of the resource, as well as challenges in ensuring participation of women and the poor in groundwater management activities.

Women and men have different priorities and needs with respect to water, which result from their different roles and responsibilities. Women and men also have different skills and knowledge with respect to groundwater use for domestic, agricultural, or other productive purposes and are affected differently when groundwater development initiatives are introduced. Even though groundwater offers different advantages, overexploitation of this resource through unregulated pumping as well as water quality issues poses serious threats to the well-being of rural persons, especially women and poor men and women.

GENDER AND ACCESS TO GROUNDWATER

A crucial issue in groundwater development and management is that of access to and use of the groundwater resource, including access to groundwater abstraction technology and groundwater management activities. Different rights come into play when discussing groundwater: rights to the resource either by virtue of owning the groundwater technology (individually or through a group) or by being a member of the groundwater users' group, rights to decide water allocation and distribution after water is pumped out, as well as adjudication and decision-making rights on who holds which rights (Gautam 2006; Zwartveen 2006). Water rights are directly related to land rights in many countries. In such cases men and women without clear land titles are restricted from being members of groundwater users' group even when they may be the main decision makers on the farm or in the household (see box 6.3 for a project that overcame this constraint). In the Andean countries, Bangladesh, India, Nepal, and countries in southern Africa, migration of men from rural areas has led to an increase in women-headed households so women are overburdened with the task of maintaining the household as well as the farms.¹ The same case can be found in Yemen (box 6.3).

Box 6.3 Yemen: Women and the Water Crisis

Yemen's water crisis has affected women adversely in different ways. Groundwater irrigation for cash cropping has resulted in aquifer depletion in different agroecological regions. Traditional sources of water-harvesting structures are no longer maintained. Women and young girls travel longer distances for water in rural areas, affecting their health, safety, and literacy levels. As more men migrate to cities and other Gulf countries, women's role in irrigated agriculture has increased, although it is not always formally acknowledged because commercial cultivation was traditionally a man's preserve. In the case of urban water supply, richer households purchase water from tanks, whereas poorer women have to line up to buy water from richer neighbors, to obtain lower-quality water from wells, or periodically to get water from municipality water projects.

Source: Frédéric Pelat, "A Brief Overview of the Water and Gender Situation in Yemen," www.idrc.ca/en/ev-99527-201-1-DO_TOPIC.html.

Box 6.4 Gender and Water Quality

Naturally occurring arsenic in groundwater poses a serious threat to more than 60 million people living in South and East Asia. Almost 700,000 people have been affected by arsenicosis in the region. Skin cancer; cancer of the bladder, kidney, and lungs; diseases of the blood vessels leading to gangrene; and reproductive disorders are the main effects of arsenic poisoning. A stigma associated with arsenicosis has serious social effects on marriage prospects for men and women, as well as for job opportunities. One of the most seriously affected regions is Bangladesh in the Meghna-Brahmaputra-Ganges Delta, where arsenic has been detected in water from shallow aquifers. Women in Bangladesh prefer tubewells over surface water because these reduce their workload. However, with the rise in arsenic-contaminated groundwater, women and young girls have been disproportionately harmed.

Sources: Caldwell and others 2002; www.worldbank.org/gwmate; www.who.int/water_sanitation_health/diseases/arsenicosis/en.

Women and girls are typically responsible for collecting water for daily needs. This includes water for drinking purposes for the household, livestock, cooking, cleaning, and overall health and hygiene within the household.

Clear water rights lead to improved access to water, which is critical for maintaining good health and a sustainable livelihood. Studies from Africa show that both rural and urban women are engaged in small-scale enterprises and that improved access to water would help them to pursue these activities more effectively.² Experience from India has shown that when groups of landless women were provided a share of water by the members of a "land-owning" water users' association in a lift irrigation project, the women were able to work out alternative livelihood strategies. They contracted the available wasteland in the village on a long-term lease and derived an income through biomass produced from this land (Kulkarni 2005), while taking part in the restoration of the land.

GROUNDWATER OVEREXPLOITATION, WATER QUALITY, AND GENDER

Groundwater use in most developing countries is not regulated. This has led to the overexploitation of the aquifers,

causing the lowering of water tables, an increase in pumping costs, and pollution of aquifers. Continued overexploitation of groundwater reduces the availability of freshwater for use and poses challenges to health for people who are bound to live near these affected areas. Groundwater is the major source of drinking water for cities in the developing world, and demand is rising with unplanned expansion of cities. Commercial agriculture and industries are other major users.

Groundwater overabstraction negatively impacts the rural poor because they cannot afford to dig deeper wells. In water-dependent societies, this particularly impacts the lives of poor women. Industrial waste disposal, wastewater from urban areas, oil spills, and excessive use of pesticides and insecticides in agriculture are some causes of groundwater pollution. In coastal areas overexploitation causes a rise in saline intrusion. Another type of groundwater poisoning that has emerged as a serious health hazard is due to naturally occurring arsenic (box 6.4).

BENEFITS FROM GENDER-RESPONSIVE ACTIONS

An institutional approach to groundwater development and management that puts gender at the center stage:

Box 6.5 Nepal: Leadership Development of Deep Tubewell Group

The Bhairahawa Lumbini Groundwater Irrigation Project (BLGWIP-III) initiated a “demand-based participatory approach” to deep tubewell (DTW) development and management. Women and men in Durganagar village sought a DTW from the BLGWIP-III only after they were convinced of the nature of the layout of the distribution system, flow and discharge rates, expected operational costs, and the possibility of integrating DTW with the traditional spring water distribution system already in use.

After realizing the design would support their interests in vegetable cultivation, they actively participated in project planning, including the layout of the underground pipe flow distribution system. Vegetable cultivation

Source: Gautam 2006.

became a lucrative business among women and smallholders who take it up on a sharecropping basis. With water in high demand, the water user group (WUG) did not face difficulties in collecting fees and has been able to hire a full-time pump operator. Both men and women actively sought out WUG leadership positions, which resulted in an overall increase in the executive board from 7 to 11 positions for the second WUG election. According to the farmers, they realized that it was “important to get a representation across all castes, ethnic lines and from women.” A woman was elected to the second committee in 2004. More women were interested but were not eligible because they were not landowners.

- Helps reduce gender inequalities in water by ensuring access to groundwater for women and those without clear land titles
- Recognizes women as important water stakeholders and recognizes the class diversity and social differentiation among women
- Facilitates the representation and participation of women in aquifer management to communicate groundwater priorities of men and women for different activities (such as irrigation versus domestic supply). Consulting with men and women from the start helps improve water regulation and governance through a bottom-up process (box 6.5).

POLICY AND IMPLEMENTATION ISSUES

Livelihood support programs featuring groundwater interventions require gender-specific approaches to realize poverty reduction and gender-equity goals. Groundwater development programs should be accompanied by efforts to create an enabling environment with gender-sensitive technical and other support services and context-specific strategies to involve both women and men in decision making at the system and aquifer levels. Intravillage groups organized around water sources are particularly important mechanisms for improving women’s access to water management at the local level.

Programs must improve women’s access to and control over groundwater resources, including through WUA membership and leadership roles:

- Introduce and maintain a “quota” system for women and disadvantaged groups in aquifer management organizations and national organizations.
- Make social mobilization and dialogue on reforming WUA membership criteria more inclusive and not dependent on men’s gender or land ownership status.
- Where women face sociocultural obstacles to interacting in public forums with men, set up separate women’s groundwater users groups. Care has to be taken that such groups are then formally linked to the larger representative user associations and apex groups. In conjunctive use settings, ensure that groundwater users are also represented in the surface irrigation system WUAs.

Planners should also create an enabling environment to enhance women’s participation and provide technical and support services:

- Facilitate access to credit, agricultural extension, and local commercial repair and maintenance services.
- Ensure that technical assistance programs (for example, training on pump installation, repair, and maintenance) target both men and women.

- Promote tubewells as women's collective enterprises, together with other specific income-generation and market linkage activities.
- Set up savings groups for the landless via the sustainable functioning of community organizations renting pump sets; part of the profit of renting out the pump is kept in a savings fund for repair and maintenance.
- Highlight women's rights in water management through awareness-raising and educational programs.
- Encourage interdepartmental dialogue regarding gender and groundwater undertaken by the water supply and irrigation departments to address the multiple water needs of the poor and women.
- Providing complementary inputs (credit access, agricultural extension, and marketing support) to women farmers helps extend the impact of water infrastructure investments and overcome their institutional disadvantage in accessing services.

GUIDELINES AND RECOMMENDATIONS FOR PRACTITIONERS

GOOD PRACTICES AND LESSONS LEARNED

Groundwater development has long focused on individual (men) "farmers" control over technology and the resource, with less attention to organizing institutions and gender impacts. Tubewell subsidies have similarly disproportionately benefited large farmers, usually men:

- Landownership as a criterion for tubewell or pump ownership or for membership in WUAs typically excludes women, smallholders, and tenants. User association criteria need to be examined closely to prevent social exclusion.
- A single-sector approach to groundwater development (especially for irrigation) has often resulted in oversized, underused pumps. The water needs of the rural poor are diverse: if drinking water and other needs are considered, the resulting infrastructure will likely be on a smaller scale and more affordable for women and the poor.
- Maintaining quota systems helps ensure that women's interests in WUAs are represented. It also generates discussions at the local level on women's rights and roles, which can be seen as a first step in awareness raising.
- Provision to women's groups of such technologies as treadle pumps, shallow tubewells, and deep tubewells is more effective when complementary training inputs in managerial and technical skills are provided. In Bangladesh women were able to successfully manage tubewells as a collective water-selling enterprise when given management control from the start (Van Koppen 1999).
- Projects that actively included both women and men in participatory planning, design, and implementation helped generate a cadre of women leaders in formal decision-making positions.
- Prioritize groundwater systems to serve both domestic and productive needs of the rural poor in programs that serve to enhance agricultural livelihoods.
- Promote lightweight and portable machines in areas with high land fragmentation and a high water table.
- Provide incentives to those WUAs that combine water-saving technologies, especially in water-deficit areas.
- Support capacity building for staff with interdisciplinary approaches and gender training to enhance social analysis skills.
- Coordinate across sectors that provide technical and support services to make sure that women and the disadvantaged are appropriately targeted.
- Develop gender-specific interventions based on the local social, cultural, and agroecological context and the nature of the project. Plan and design water use systems through a participatory inclusive process.
- Allow for flexibility to incorporate innovative strategies for both the technical and institutional designs, rather than using a rigid blueprint approach. Men and women may have different choices in terms of site selection, design, and layout of groundwater structures. Differences may also exist in preferences between foldable canvas pipes, underground pipes, or open flow channels for water distribution. If wells are to serve both domestic and productive needs, a decision on the location (between homestead and field) is important to minimize walking/water-carrying distance.
- Identify existing women's groups and coordinate with women's organizations, NGOs, cooperatives, and professional women's networks for enhanced gender inclusion in countries where such provisions exist. Examples from the Licto project in Ecuador show that women wanted water titles to be in the names of both husbands and wives after a long period of awareness raising by an NGO (GWA and Both ENDS 2006).

Box 6.6 provides questions for gender-responsive project design.

Box 6.6 Sample Questions for Project Design

Institutional approaches to groundwater development and management should include gender analysis throughout the project cycle. Issues of water rights determine access and control over groundwater resources. Men and women may differ in their preferences and needs for water and are affected differently when groundwater is introduced. Some specific design questions and indicators to take into consideration are the following:

- How have rights to groundwater abstraction technology ownership been defined (in terms of landownership)? Are there asset or collateral requirements?
- How have criteria for water users' group membership been defined?
- Are there land title or groundwater technology elements that may constrain the participation of women or the poor?
- What are the access and use rights to groundwater once it has been pumped? Who defines this, and who has the right to dispose of the right or adjudicate disputes?
- Who makes decision regarding allocation and distribution of water? Are women involved? Are women members of the WUAs? Are they in leadership positions in these groups?
- Does the project design take into account user flow preferences for specific crops, from different water sources?
- Has technical training and access to complementary support services been provided to both men and women?
- What are the expected changes in workload for men and women with the introduction of groundwater infrastructure (for example, might the workload for women increase in the case of irrigation and decrease for domestic water collection?).

Source: Authors.

Ghana: Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP)

The Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP) was initiated in the early 1990s by the International Fund for Agricultural Development to contribute to the poverty reduction and improve livelihoods of the second poorest region of Ghana through irrigation and agricultural development.

The second phase LACOSREP (1998–2006) was aimed at addressing the shortcomings of the first phase of the project. Although WUAs were established as a precondition for small-scale dam construction and rehabilitation in the first phase, they were not considered as a key component of the project's implementation strategy. These WUAs lacked the necessary organizational skills and a clear legal status, which explain the modest achievements in some sites, with respect to collected fees, catchment area protection, and adequate operation and maintenance. The last two factors are critical to the sustainability of the small-scale dams. It was also recognized that the project in its first phase was not able to address adequately

What's innovative? The membership in water users associations (WUAs) was not limited to farmers associated with irrigation or to one member per household, and thus opened up the opportunity to get women involved in WUAs. The recognition of multiple types of users (gardeners, livestock owners and fishermen) facilitated WUA development. This also strengthened the WUAs, by avoiding possible conflicts over water use and facilitating watershed protection measures. A quota of irrigated land allocation was also established for women so that they could get access to water from the irrigation schemes and be involved in the decision-making process.

important issues such as capacity building of the WUAs and women's access to land and water. Therefore, the second phase of the project sought to pursue rigorously and systematically granting women access to dry season irrigated plots by involving them in WUAs and establishing a quota in-plot allocation for women. WUAs thus played a greater role in the planning of the whole irrigation project and had a clear understanding on their part of their obligations to ensure the sustainability of the project (IFAD 2003).

PROJECT OBJECTIVES AND DESCRIPTION

The objectives of LACOSREP II were to (1) further develop irrigation in the Upper East Region; (2) increase productivity through farmer training and demonstrations of new technologies for increasing the productivity of crops, livestock, and fish; (3) build the capacity of government institutions that provide technical and social services at the district and sub-district levels; and (4) construct rural infrastructure to reduce women's labor burden and take measures to mitigate the possible risks of health and negative environmental impacts.

The target group included rural people and smallholders, landless farmers, and women, in particular women-headed households. The beneficiaries were drawn from the "at risk" category that embraces both economic and social criteria and included those most at risk from malnutrition, ill health, and a generally low quality of life. They came from an area that had the highest population growth rate (3 percent) and the lowest living standards in the country. About 50 percent of the direct beneficiaries (34,400) were estimated to be from the target group.

INNOVATIVE ACTIVITIES IN THE PROJECT

The project had two innovative activities: (1) membership in WUAs was not limited to farmers associated with irrigation or to one member per household and, by doing so, opened

up the opportunity to get women involved in WUAs; and (2) a quota for irrigated land allocation was established for women so that they could get access to water from the irrigation projects during the dry season and be involved in the decision-making process.

The program identified three groups of predominant water users: gardeners, livestock owners (coinciding or not with gardeners), and fishermen. The apex WUA was defined as a combination of these subgroups, with an executive body comprising members from each of the three subassociations. The project offered substantial material incentives, including food rations and improved irrigation facilities, for farmers, livestock keepers, and fishermen to participate in the small-scale dam construction and rehabilitation and WUA activities. The recognition of different stakeholder groups facilitated WUA development. This also strengthened the WUA by avoiding possible conflicts over water use and facilitating watershed protection measures.

The WUAs were responsible for land allocation in the dam command areas; modalities of this procedure were left up to them to decide, the only condition being that plot sizes should be equal, not smaller, for women, and 40 percent should be reserved for women. This affirmative action was taken to give women access to productive resources because traditionally in this region women did not own land and to encourage their participation in WUAs.

Another innovative aspect of the project was the incorporation of disabled and blind farmers in the WUAs, as a form of social equity and inclusive targeting in some communities. This is a replication of the successful IFAD project in Upper West Region, where blind WUA members (a majority being women) have sustainable access to land and water. The use of community animators in tandem with extension staff was catalytic, and facilitatory mechanisms were set up for the acceptance of this category of water users.

GENDER APPROACH

WUA membership was open to all members of the target group who would benefit from the results of the project as smallholder dry season irrigators (gardeners), livestock owners, and fishermen. The percentage of women who became ordinary members was around 38 percent (and thus slightly below the 40 percent target of the project). At some dam sites, this figure, however, was much higher, up to 80 percent. Typically, general meetings were held once a month, and a quorum for decision-making authority was spelled out in the WUA bylaws. Although a woman did not become chairperson, it was common for the executive

committee's treasurer to be a woman. Furthermore, women have formed an exclusively women's group that provides a platform to discuss and form a unified opinion before any major decision is discussed in the WUA.

The main activities of the project that helped achieve the gender-mainstreaming-related objectives of the project include (1) recruitment of a gender officer, (2) farmer training demonstrations (FTDs), and (3) functional literacy groups (FLGs).

LACOSREP II employed a gender officer on a contract basis to ensure the objectives of appraisal were met; this was an effective strategy.

FTDs were conducted based on community needs assessment and planning exercises. Farmers were trained, among other things, in composting and vegetable growing. Out of 6,266 participating farmers, 40 percent (2,546) were women. This shows a considerable achievement by the project in getting a good representation of women within the groups.

FLGs, which were originally not included in the project design, were introduced during the implementation of the project to teach beneficiaries (most of them women) numeracy and literacy in indigenous languages. These groups were also aimed at establishing solidarity among groups for other purposes such as collective work and microfinance.

Other special, transitional measures taken to promote women's participation in all aspects of the project included charging slightly lower fees to women members of WUAs, although this was not applied throughout all the associations, and accepting illiterate women in community credit management committees.¹

BENEFITS AND IMPACTS

The overall impact of LACOSREP II on beneficiary communities has been considerable in the areas of food security, income generation, cohesion, literacy, and promotion of gender issues.

Women are not traditionally land owners in this region, but the WUA system has given them direct access to dry season irrigated land. As a consequence, women play a much greater role in the management of irrigation; this is highly visible at meetings in which they speak up to represent their own views. The project has undoubtedly been influential in promoting these changes and making them sustainable. Women can grow vegetables more easily: this both contributes to food security and improved nutrition and generates cash.

Given a demonstrated, strong correlation between widowhood and extreme poverty, the inclusion of vulnerable

women-headed households in at least some WUAs is an indication of the project's having been able to reach IFAD's target group.

WUAs and FLGs have also had an impact in creating modalities for increased social solidarity; the previous patterns of dispersed household settlement are changing as communities develop and perceive a need to act together more coherently in accessing key tools and input in community development.

FLGs have also provided an arena for women to cooperate and organize collective income-generating activities. The project's interim evaluation report (IFAD 2006) reported the changing dynamics of the household decision-making patterns. Husbands were reported to be listening increasingly to their wives' views on issues concerning the household and even passing on financial responsibilities to their wives, as they consider them to be financially knowledgeable. Access to greater capital and means of transport, such as bicycles, has undoubtedly accelerated women's entry into the market. The livestock component, by increasing access to investments in goats, chickens, and guinea fowl, has played a similar role.

As a contribution to institutional sustainability and empowerment, WUAs were envisaged to evolve into a "council" at the district level. Formation of district WUA councils was embedded in the project as one of the exit strategies. To date, only one council was formed with elected WUA council executives, with an operational bank account and draft by-laws. Other WUA councils are under development, and an important issue remains how to mainstream gender considerations into their operational plans systematically.

LIMITATIONS AND CONSTRAINTS

The project has successfully involved women in WUAs, but it has not been as successful on other fronts, such as providing mitigation measures for water-borne diseases. Moreover, a large number of hand-dug wells (about 40 percent of the total), which were aimed at reducing the workload of women in fetching water, are not functional (IFAD 2006). In some communities water for domestic use is fetched from the small-scale dam, which creates health and social problems.

It was also observed in some cases that plot sizes were not always equal in practice. Plot allocation differed according to, among other means, patrilineal versus matrilineal population groups; the personalities and the "morphology" of

local traditional authorities, for example, the degree of decision-making power of the traditional landowner, that is, the man descendent of the community's founding lineage—the *tindana*, earth priest, or *tigatu*—versus that of other clan heads ("headmen"), family heads, chiefs (called "skins"), and government; and the degree of "urbanization" and "politicization" (IFAD 2006).

Paradoxically, where women have access to equal (to that of men) irrigation plots, evidence suggests that these plots are overfragmented, in part because of social relations and in part because of women having limited time for agricultural labor and maximization of the output from their irrigated plot. This implies that gender-equity issues must be contextualized in project design and implementation.²

Another major challenge lies with ensuring effective operation and maintenance of district-level WUA councils. Line ministries responsible for the development of WUA councils have limited resources and capacities at the district level.

LESSONS LEARNED AND ISSUES FOR WIDER APPLICABILITY

- Consideration of multiple users and organizing them is a sure way to obtain beneficiaries' commitment and active participation in project activities.
- Domestic water inclusion needs to be done carefully: domestic water supply is a basic need and requires adequate technical measures to address health issues properly. Also, addressing domestic water requirements is a way to give women an opportunity to engage more in income-generating activities.
- Social equity and inclusive targeting of the marginalized and disabled rural poor can be mainstreamed into WUA activities.
- WUAs to some extent secure a "minimum platform" to ensure greater participation of women in the WUAs' decision-making processes if membership criteria are transparent and equitable.
- Bottom-up approaches to WUA formations thrive where legal and institutional frameworks exist and decentralization is advanced.
- Upscaling WUAs to district, regional, and national WUA councils will be self-empowering, but also the means for WUAs to engage in policy dialogue, advocacy, and autonomy at higher levels, where attention can be brought to women's needs.

The Gambia: Lowlands Agricultural Development Programme (LADEP)

Rice production in The Gambia is traditionally a woman's domain, with the men concentrating their farming efforts on cereals and livestock in the uplands. Rice land ownership in the traditional system is vested to men first settlers who allocate rice land to their wives and daughters. The rest of the women rice farmers (later settlers) depend on borrowing rice land on an annual basis, without the assurance of availability (renting or share cropping of farmland is not common in The Gambia). This traditional land tenure system discourages landless women rice producers (later settlers) to participate in any land reclamation efforts, because the land does not belong to them, and they have no secured access to land, even in a midterm perspective. Owners of large tracts of land cannot provide the labor required for reclamation of these lands, and therefore land reclamation is not implemented. For successful implementation of self-help (through the provision of labor and locally available materials), the issue of access to land had to be resolved.

PROJECT OBJECTIVES AND DESCRIPTION

The main objective of the IFAD-supported Lowlands Agricultural Development Programme (LADEP; 1997–2005) in

What's innovative? Community participation was made mandatory during the design phase. Land was allocated in exchange for labor provided to rehabilitate swamps for rice production. A site selection committee and intercommunity negotiations were set up to look into cross-cutting issues in the community; subsequently, a "land for labor" agreement, valued under traditional law, was reached between the program's beneficiaries and the founder settlers of the community.

The Gambia was to involve local communities in the development process of national socioeconomic issues and to have them assume control over some activities and be empowered to make their own decisions on matters pertaining to their development.

The objectives of the innovation were as follows:

- Mobilize the beneficiaries to provide the self-help labor required to rehabilitate or develop rice fields.
- Create the environment under which landless women rice producers would permanently own land.
- Make sure that the beneficiaries take over the responsibility of repairing and maintaining the infrastructure after the project phases out.

LADEP was targeted to benefit 8,960 rice farmers under various rice-growing ecologies in the country, on 8,075 hectares of land. The intended beneficiaries were the farmers, mainly women (about 90 percent), who participated in the land reclamation efforts.

INNOVATIVE ACTIVITIES IN THE PROJECT

During the design phase of LADEP, community participation was made mandatory. The main innovative activity of the project was allocation of land in exchange for labor provided to rehabilitate swamps for rice production.

This innovation was chosen from a range of options identified by focus group discussions (part of the site management committee [SMC], itself part of the village development committee [VDC] introduced by the government):

Option 1: Use of machinery for the construction of the required infrastructure without changes in the land tenure system. Here ownership of the infrastructures, an important factor for future operation and maintenance, could not be secured.

Option 2: Construction of the infrastructures by the landowners. This option faced labor shortages by the landowners.

Option 3: Devolution of ownership of an equal piece of land from traditional landowners to a few men and mostly women of the communities who participated in the reclamation efforts. With the devolution of land ownership, the people had a clear incentive to contribute their labor to reclamation efforts.

The program's other innovative features included setting up site selection committee and intercommunity negotiations. Site management committees were established to look into cross-cutting issues in the community related to rice production, particularly the provision of labor and land allocation. The committees were grouped under 35 district-level farmers' associations. A legal constitution as a community-based organization was prepared for the farmers' associations and adopted in a participatory manner, before their official registration. Institutional sustainability is one of their goals, as well as an increased contribution of farmers to local decision-making processes.

Intracommunity negotiations were facilitated using the participatory rapid appraisal (PRA) method to find solutions to common community problems. The PRA method was first introduced to extension services in charge of mobilizing communities under program activities and was the foundation of the self-help approach adopted under LADEP. Through these negotiations, a "land for labor" agreement was reached between the program's beneficiaries and the founder settlers of the community. When such an agreement is made at the community level, it gains legal value under traditional law.

GENDER-RESPONSIVE ACTIVITIES

The project's innovation activity addressed the landlessness of women, traditional rice growers, and consisted of transferring the ownership of an equal piece of land from traditional landowners to the few men and mostly women of the communities who participated in the reclamation efforts. These "land against labor agreements" between landless individuals and founder settlers (landowners) were made in the presence of the whole community, which conferred a traditional legal status to the agreement. This option was chosen because of the following advantages: the allocation of land to landless women farmers who participate in reclamation efforts and the recognition of the need for women farmers to own land if they are to invest their labor in its reclamation.

The innovation of providing land ownership to landless rural people, mainly women, helped provide the long-term incentives required to mobilize beneficiaries to (1) provide the labor necessary to rehabilitate rice fields and (2) assume responsibility for infrastructure operation and maintenance after the close of the program. The innovation brought about changes in the traditional land tenure system. In the traditional system, land tenure was held by founder settlers (who were sometimes women). LADEP brought about the devolution of individually owned land to the community, and this new common land was equitably redistributed and shared among individuals, mainly women, who participated in land reclamation works.

The main factors that facilitated the innovation and played an important role in the success of the project are the following:

- The setting up of SMCs to look into the community's cross-cutting issues, especially the provision of labor and land allocation
- The facilitation of intracommunity negotiations to find solutions to common community problems.

Other actions that contributed to the success of the project include the steps taken at the design phase of the project to ensure community participation in the decision-making process:

- Public extension services sensitized communities concerned with the lowlands on LADEP.
- Public extension services collected formal requests for assistance.
- A community mobilization coordinator (belonging to the Department of Community Development, delegated to the project) visited selected communities to establish SMCs, as part of the VDCs established by the government when they existed. The process involved participatory rural appraisal, focus group discussions in which beneficiaries and the local government authorities were presented the advantages and disadvantages of each option and supported the elaboration of community action plans.

BENEFITS AND IMPACTS

The innovation brought about changes in the traditional land tenure system. In this traditional system, land tenure was held by founder settlers (women in a few instances). Yet the innovation represents the devolution of individually

owned land back to the community and the sharing of this new common land property among the individuals who participated in land reclamation works.

The innovation settles the issue of land ownership in the project intervention sites. Land tenure security for the land poor has contributed to food security in no small way because of more land reclamation efforts and more land being cropped.

Planners assessed the performance of the innovation and made an impact assessment of the project. The main findings are the following:

- Poverty is streamlined as more women farmers own land and confidently work it for production. Women beneficiaries now have permanent ownership of land, and their children will inherit ownership of the land.
- Women have benefited greatly. LADEP was targeted to benefit 8,960 rice farmers in various rice-growing environments in the country, on a total area of 8,075 hectares of land. LADEP reached 24,684 farmers (90 percent of them—a total of 22,216—women) and reclaimed a total of 7,481 hectares of land.
- Community cohesion has increased.
- Beneficiaries reported a 30–100 percent increase in food production. The impact assessment found that most communities report that with upland and lowland crops they are now food secure.
- Either by water retention or swamp access, the LADEP experience resulted in an additional three months each year of rice self-sufficiency.
- Food self-reliance and household food security were improved as more land was put under cultivation. The advantage of the process followed lies in its self-regulation: communities develop the area they can actually manage to reclaim and cultivate.

LESSONS LEARNED AND ISSUES FOR WIDER APPLICABILITY

The LADEP experience provided evidence that people-led project interventions contribute to the sustainability of change. Also, the following principles or lessons were identified:

- Land reforms have to be initiated by the beneficiaries and agreed upon by mutually binding arrangements (under traditional or other law).
- Household food security can be improved if the landless are assisted in securing land permanently.

- Poverty can effectively be reduced when rice land is equitably distributed.

The key contextual elements that should be considered as prerequisites for replication outside of The Gambia are the following:

- *Social*: The communities, including the landowner minority, should be prepared to negotiate favorable land allocation systems.
- *Regulatory*: Land reforms under local government reforms (decentralization processes) should exist to support the innovation.
- *Institutional*: The village development committee concept, through which negotiations with site management committees can be jump-started, must be present.

NOTES

Overview

This Overview was prepared by Juan A. Sagardoy (Consultant) and reviewed by Chitra Deshpande Gunnar Larson, and Catherine Ragasa (Consultants); Sasha Koo (FAO); Maria Hartl (IFAD); and Nilufar Ahmad, Indira Ekanayake, and Anne Kuriakose (World Bank).

1. *FAO's Gender and Development Plan of Action 2008–2013*, conference, Thirty-fourth Session, Rome, November 17–24, <ftp://ftp.fao.org/docrep/fao/meeting/012/k0721e.pdf>.

2. Additional material is available at the GAL *eSourcebook* at www.worldbank.org.

3. FAO, “Gender and Food Security Statistics,” www.fao.org/Gender/stats/genstats.htm.

4. See also Technical Note 3 in the GAL *eSourcebook* at www.worldbank.org.

Thematic Note I

This Thematic Note was prepared by Barbara van Koppen (Consultant) and Anne Kuriakose (World Bank) and reviewed by Robina Wahaj (Consultant); Rudolph Cleveringa, Maria Hartl, and Audrey Nepveu (IFAD); and Indira Ekanayake and Riikka Rajalahti (World Bank). Many concepts and evidence in this note are based on the findings of the action-research project “Models for Implementing Multiple-Use Water Supply Systems for Enhanced Land and Water Productivity, Rural Livelihoods and Gender Equity” (www.musproject.net), supported by the Challenge Program on Water and Food of the Consultative Group of International Agricultural Research (www.waterforfood.org). Initial findings of this research project are also synthesized in Van Koppen, Moriarty, and Boelee (2006).

1. Ede Ijjasz-Vasquez, Mexico World Water Forum, PRODWAT 2006, www.musproject.net/content/download/810/8113/file/MUS%20Stockholm%20meeting.pdf.
2. Lenton, GWP, Mexico World Water Forum, PRODWAT 2006, www.musgroup.net/content/download/555/5690/file/Newsletter%20.
3. www.musproject.net.

Thematic Note 2

This Thematic Note was prepared by Suman Gautam (Consultant) and Anne Kuriakose (World Bank) and reviewed by Karin Kemper and Catherine Tovey (World Bank) and the GW-MATE team; and Indira Ekanayake (World Bank).

1. Both ENDS, “Effective Gender Mainstreaming in Water Management for Sustainable Livelihoods: From Guidelines to Practice,” Both ENDS Working Paper Series, November 2006, www.bothends.org.
2. Eva M. Rathgeber, “Women, Men and Water-Resource Management in Africa,” www.idrc.ca/en/ev-31108-201-1-DO_TOPIC.html.

Innovative Activity Profile 1

This Innovative Activity Profile was prepared by Robina Wahaj (Consultant) and reviewed by Catherine Ragasa (Consultant); Moses Abukari, Maria Hartl, and Audrey Nepveu (IFAD); and Indira Ekanayake (World Bank).

1. CCMCs assisted in group mobilization and training and were responsible for screening loan requests using local knowledge of the community and the groups, and assisted in loan recovery. The groups were required to have at least three women members out of seven.
2. IFAD and GTZ, “Knowledge Profiling: Promoting Easy Access to Knowledge and Experience Generated in Projects and Programmes: A Manual,” www.ruralpovertyportal.org/english/topics/water/ifad/manual/kp.pdf.

Innovative Activity Profile 2

This Innovative Activity Profile was prepared by Robina Wahaj (IFAD) and reviewed by Catherine Ragasa (Consultant); Moses Abukari, Maria Hartl, and Audrey Nepveu (IFAD); and Indira Ekanayake (World Bank). This Profile was adopted from Nepveu, Fye, and Cleveringa (2005).

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