

What Gender Analysis Can Contribute to Irrigation Research and Practice in Developing Countries: Some Issues

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ABSTRACT

This paper attempts to demonstrate the contributions that gender analysis can make to improve our understanding of irrigation system operations and management in the context of the concern researchers have for enhancing the impact of irrigation. The authors examine three issues—women's roles as farmers and irrigators, irrigation management, and cost recovery and pricing. Because so little gender-related research has been done thus far, much of the discussion is conceptual. It briefly reviews the literature that is currently available on the three issues and, more importantly, explores promising issues for future research.

Because of the urgency associated with growing water scarcity, the concern for expanding food and agricultural production to keep pace with growing populations and rising incomes, and the need to use water more efficiently, researchers are exploring new ways to achieve these outcomes. The focus on improving management through increased user participation is especially favorable for implementing research that contributes to a better understanding of the current and potential roles and contributions of women in irrigation. It is also a good time to pilot test and document the ways in which women can better contribute to irrigation management, cost recovery, and improved agricultural production. The challenge, now, is to seize these opportunities in research and practice to improve irrigation performance, enhance agricultural productivity, and improve the well-being of people.

INTRODUCTION

Demand for food in developing countries is expected to more than double by 2025, requiring more than a doubling of average yields of food grains to ensure food self-sufficiency. Over the past 50 years, irrigation development has been a major factor in enabling the yield increases necessary for food grain production to keep pace with rapid increases in demand. The

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area under irrigation grew between 15 and 25 percent in different regions of the world between 1980 and 1994 (World Bank 1997). In the future, however, growing water scarcity is likely to pose a serious challenge to the needed expansion in food production and, by extrapolation, to meet other development objectives such as poverty alleviation and employment generation (Kijne and Bhatia 1994; Postel 1996). In particular, the scope for increasing area under irrigation is limited. Most of the best sites have already been exploited, costs of new irrigation development are rising, and funds for new schemes are dwindling (Kijne and Bhatia 1994; Rosegrant 1997). It is unlikely that much new irrigation development will be undertaken in the future (IIMI 1995).

There is growing concern that the area under irrigation has actually declined in recent years, and may continue to do so. Factors responsible include increased competition for the use of irrigation water for urban and industrial consumption, depletion of groundwater and other alternative water sources, and increased salinity. The productivity of irrigated areas is also declining because of salinization. It is estimated that more than 10 percent of the world's irrigated area may have enough salt buildup to lower yields (Postel 1996).² These developments suggest that future increases in food production will have to come from sources other than expansion of irrigated area such as new technologies and improved use of available water supplies and irrigated areas. Irrigation researchers believe that improvements in water use efficiency in irrigated areas are essential for the future (Kijne and Bhatia 1994).

Major problems in the irrigation sector include the inability of farmers to fully realize the planned potential of irrigation, inadequate maintenance of irrigation infrastructure, poor management of systems, the high cost of operations and maintenance (O&M), limited success with cost recovery, and the poor performance of irrigation bureaucracies. Until recently, most irrigation systems were managed by large governmental bureaucracies that were responsible for operating and maintaining the systems and that are now held largely responsible for the current difficulties. For instance, part of the explanation for farmers' failure to achieve anticipated productivity results is that they have learnt water delivery is unreliable and beyond their control. This is often due to the failure of irrigation agencies to properly manage and deliver water in response to farmer needs and prevailing conditions. Also, because systems were not properly maintained, over time rehabilitation and maintenance became very costly and now command large proportions of development budget outlays (de Graaf and van den Toorn 1995).

In response to these problems, over the past 20 years researchers and irrigation agencies have been experimenting with newer and more flexible approaches to irrigation management. These experiments started with paying greater attention to the farmers or "users" of irrigation and involving them in O&M. More recently, efforts have been directed at privatizing functions, including transfer of management functions and cost recovery to water user associations (WUAs). Privatization also involves experimenting with the establishment of water markets and pricing water in an effort to increase efficiency of water use. Current research on improving irrigation system performance, therefore, focuses on issues related to irrigation efficiency, management transfer, cost recovery, and efforts to retain irrigation water for agri-

²Rosegrant (1997) gives further estimates of annual global losses of agricultural land due to waterlogging and salinization, ranging from 160,000 hectares to 1.5 million hectares, most of which have accrued in irrigated croplands with high production potential.

cultural uses in the face of increased competition in higher-valued uses. While efforts are being exerted to strengthen irrigation agencies and enhance the skills and capacity of irrigation staff, a great deal of the focus is on users.

The growing emphasis on users in irrigation research necessitates identification of the varieties of users and uses of irrigation water. An accurate picture of who uses water and for what purposes is necessary to develop appropriate policies to improve system performance and to bring about desired development impacts, especially those of enhancing agricultural production. The scant literature that is available demonstrates that gender is an important factor determining differences in the uses and intensity of the application of irrigation water (Agarwal 1981; Cloud 1984; Jones 1981; Zwartveen 1994). As such, it may be an important variable as well in explaining levels of performance and irrigation impacts and offering insights into the improvements currently being sought in efficiency and management.

This paper attempts to demonstrate the contributions that gender analysis can make to improve our understanding of irrigation system operations and management. In the context of the concern researchers have for enhancing irrigation efficiency and impact, the authors examine three issues—women's roles as farmers and irrigators, irrigation management, and cost recovery and pricing. Because so little gender-related research has been done thus far, much of the discussion that follows is conceptual. It briefly reviews the literature that is currently available on these issues and, more importantly, explores promising issues for future research.

By way of introduction, it is important to clarify a few key assumptions. First, it is assumed that the objective of development policy and actions is to improve the welfare of people, women and men alike. Second, improving the welfare of people entails increasing the availability of goods and services, i.e., enhancing output. Third, it is assumed that one of the objectives of development is to ensure that increases in output are more equitably distributed both among socioeconomic groups and between the sexes. Equitable distribution is not automatic because of unequal power relations and entrenched vested interests between classes and sexes. It follows, therefore, that promoting equitable distribution must itself be an explicit goal of development. Finally, because irrigation is an important input into the development process, it must contribute to increased agricultural output and productivity, and the resulting benefits must be equitably distributed among women and men and between social classes.

WOMEN, AGRICULTURE, AND IRRIGATION

An important focus of the early literature on women and irrigation was to demonstrate the failures of irrigation schemes because they did not take account of women as farmers. Thirty years later it is still true that women are not "officially" recognized as farmers and irrigators. As has often been the case with other farm technologies, women were not initially provided direct access to irrigation and now, therefore, little empirical data are available to show that women do use irrigation water for farming. Nevertheless, there is enough information on women's contributions to agriculture and on women irrigators to warrant reexamination of assumptions about women and irrigation and to obtain a more accurate picture about the users and uses of irrigation.

Women as Farmers and Irrigators

Twenty years of research on women's roles in agriculture has provided convincing evidence that women are farmers and that their contributions to farm production and household support are significant (Mehra 1995). Given the scarcity of water in many places and at particular times and the widespread availability of irrigation, it is hard to imagine that, whatever the official rules, women do not use irrigation. Although information is difficult to obtain because of the nature of the rules that exclude women from irrigation use and their understandable desire not to admit to flouting rules and norms, in fact, evidence is beginning to emerge that women use irrigation water for farming. Studies in countries such as Bangladesh, Burkina Faso, Nepal, Pakistan, Peru, and Sri Lanka provide direct and indirect evidence of women's use of irrigation (Lynch 1991; van Koppen and Mahmud 1996; Zwartveen 1993a; 1994; 1997a).

Official statistics show that women represent 54 percent of the agricultural and related labor force in sub-Saharan Africa and 65 percent in Southern Asia, and their participation may be growing (United Nations 1995). Actual participation by women is likely to be much higher because formal labor force statistics have been found to underestimate women's participation in agriculture. In Malawi, for example, Saito (1991) found that women perform 50 to 70 percent of all agricultural work and account for 69 percent of all farmers. An earlier study in Western Kenya found that women provided the majority of the agricultural labor and managed two-fifths of the farms (Staudt 1985). Even in places where it is often assumed that women's roles in agriculture are limited, more detailed examination shows that women are intensively involved in a wide range of activities. In Madhya Pradesh, India, Marothia and Sharma (1985) found that women performed many of the tasks and contributed at least half the labor used in rice production on medium and large farms. Mowbray (1995) found this to be true in Indonesia, Thailand, and the Philippines as well. Mowbray also found that, in Bangladesh, landless and poor women do as much as 80 percent of the work in rice production.

Women's farm roles vary by region, economic and political conditions, cultural beliefs, norms, and personal circumstances. They also change over time. The extent to which women are involved in decision making, the division of labor between women and men in the actual tasks performed, the production of cash or subsistence crops, whether women provide paid or unpaid labor, and the extent to which women retain income from farm production also vary greatly between and within regions and subregions (Bullock 1994). Very generally, women have greater responsibility for independent farming, particularly in the production of food crops, in sub-Saharan Africa, whereas in Asia, they are more likely to contribute labor to family production or to work as wage laborers if they belong to landless households.

A common pattern of production in sub-Saharan Africa is a gender division of labor between cash and food crops, with women primarily responsible for food or subsistence crops while men grow cash crops with a share of the labor provided by women. In food production, men may clear the land at the outset of a cultivation cycle and women frequently do the planting, weeding, harvesting, and processing of food crops with little or no intervention from men. Women thus cultivate and manage their own plots by themselves or with the help of their children, make their own decisions, and have control over their own earnings (Koopman 1993). In addition, they may contribute labor on their husband's or senior male kinsmen's plots.

In Asia, where the gender division of labor may be less well-delineated between crops, and women play more of a co-farmer role, they may still exercise varying degrees of influence over farm management and decision making. In parts of Nepal, for example, where farmers use high-yielding crop varieties, Ahmed (1987) found that women made 81 percent of the decisions pertaining to seed selection and 60 percent of those concerning the use of improved seeds. They also made 40 percent of decisions (versus 32.5 percent by men alone) about fertilizer use.

Each of these differences has important implications for irrigation research and practice. Thus, women's demand for and uses of irrigation water for agricultural purposes can be very varied, and this demand differs from that of men. These are important considerations for irrigation management, as will be shown below.

In households headed and/or managed by women across regions, women are often the primary farmers, often solely responsible for day-to-day decision making. Rural women become responsible for maintaining households for a variety of reasons that include widowhood, divorce, or separation, and because men migrate in response to employment opportunities in urban areas or overseas. Women who are left behind, sometimes for long periods at a time, become directly and often solely responsible for farm production and decision making. Approximately one-fourth of rural households in sub-Saharan Africa, for example, are estimated to be headed by women and, in some countries such as Burkina Faso, rates can be as high as 50 percent (United Nations 1995). Female headship of households is also growing in other regions (Buvinic and Gupta 1997, Mowbray 1995). In Thailand, the percentage of households headed by women increased from 12 percent in 1975 to 22 percent in 1990 (United Nations 1995).

The few available studies show that women irrigators are more likely to be found in women-headed households or those in which men are absent. Lynch (1991) found that most women who participated directly in irrigation in Cajamarca, Peru, were de facto wives of male migrants or the infirm or de jure heads of households (single women, widows, etc.). In the Mahaweli System H in Sri Lanka, Zwarteveen (1994/1995) found that widows own 20-30 percent of the irrigated farms. In parts of the Chhattis Mauja system in Nepal, more than 50 percent of the users of irrigation water were de facto women heads of households (Zwarteveen and Neupane 1996).

Implications for Farm Productivity

A key contribution made by researchers who studied the intra-household and productivity impacts of irrigation as early as the 1980s was to show the inappropriateness of the widely held assumption that the household is a unitary decision-making unit. They demonstrated that the consequences of this assumption could undermine the output objectives of irrigation (Jones 1983, 1987; Carney 1988a; Carney and Watts 1991).

Carney (1988a; 1988b) for instance, showed that an irrigation scheme in The Gambia almost failed because it assumed unified decision making within households. In particular, irrigation planners assumed that women would be willing to supply, without compensation, the incremental labor needed to make crop production successful on the irrigated areas allocated to men. In fact, women did not. Women themselves traditionally grew rice and were unwilling to provide labor on men's plots because they lacked appropriate incentives and/or

- Zwarteveen, Margreet. 1995. Gender aspects of irrigation management transfer: Rethinking efficiency and equity. In *Irrigation management transfer*, ed. S. H. Johnson, D. L. Vermillion, and J. A. Sagardoy. Rome: International Irrigation Management Institute and Food and Agriculture Organization of the United Nations.
- Zwarteveen, Margreet. 1997a. *A plot of one's own: Gender relations and irrigated land allocation policies in Burkina Faso*. Research Report 10. Colombo, Sri Lanka: International Irrigation Management Institute.
- Zwarteveen, Margreet. 1997b. Water: From basic need to commodity: A discussion on gender and water rights in the context of irrigation. *World Development* 25(8):1335-1349.
- Zwarteveen, Margreet, and Nita Neupane. 1996. *Free-riders or victims: Women's non-participation in irrigation management in Nepal's Chhattis Mauja Irrigation Scheme*. Research Report No. 7. Colombo, Sri Lanka: International Irrigation Management Institute.