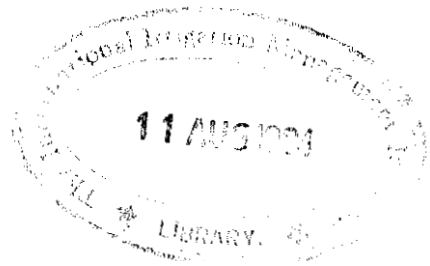


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Gender Issues and Irrigation Management

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First Annual Progress Report for 1993/1994



Submitted to

**The Dutch Ministry of Foreign Affairs, Section
Women and Development (DGIS/DST/VR)**

by the

H 14943

**Gender Program
International Irrigation Management Institute
Colombo, Sri Lanka**

August, 1994

Gender Issues and Irrigation Management

First Annual Progress Report for May 1993 - May 1994

Project Name: Gender Issues and Irrigation Management
Submitted to: DGIS DSTNR
Project No.: DST/VR242/93
DGIS letter: May 17,1993
Project Period: Two years
Submitted by: Gender Program, International Irrigation Management Institute.

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1. INTRODUCTION

This progress report on the Project "Gender Issues and Irrigation Management" covers the first year of the Project, from May 1993 to May 1994. The IIMI Gender Program was initiated in March 1992, with the secondment of Ms. Margreet Zwartveen to IIMI by DGIS. IIMI's Gender Program is a cross-cutting theme, with its intellectual home in IIMI's Local Management Program. With the arrival of Dr. Sam Johnson III as the Program Leader for this Program, supervision of IIMI's gender activities shifted from Dr. Doug L. Vermillion to Dr. Sam Johnson III.

The activities of the Project, as outlined in the original project proposal (September, 1992) are: (1) Comparative Assessment; (2) Gender Components for IIMI Research; (3) Information Services and (4) Training.

During the report period, a comprehensive literature review was finalized and a conceptual framework for the identification of gender issues of relevance to irrigation management was developed.

Case studies to collect in-depth information on the linkages between irrigation management and gender were carried out in Nepal and Niger. In Niger, a workshop was organized to present and discuss the study findings with interested irrigation and Women in Development (WID) professionals. In Nepal, a seminar for the Institute of Engineers was held.

Studies were also initiated in Sri Lanka and Burkina Faso. The Sri Lanka case-study was set up as a gender component of an on-going IIMI study on Participatory Management Programs in Sri Lanka, which focusses on monitoring and evaluating the progress of new, participatory irrigation management approaches. The study in Burkina Faso is meant to fill in the gender gaps in the information previously produced by IIMI, specifically regarding the intra-household organization of agricultural production.

Networking and information dissemination activities included the provision of assistance and information to various organizations and NGOs; the inclusion of various gender articles in the FMIS Newsletter and IIMI contributions to an international workshop.

This first Progress Report describes all the above activities in greater detail.

2. COMPARATIVE ASSESSMENT

2.1 *Literature Review*

The collection, review and analysis of available literature on gender and irrigation was finalized in June, 1993. A draft report documenting the findings of the review, and proposing a framework for the identification of gender issues in irrigation management was prepared. After a careful review by IIMI and non-IIMI staff, it was decided the report would be published as an IIMI paper. Uncertainty and disagreements about the status of the report have considerably delayed this. Publication as an IIMI working paper will occur in the second year of the Project.

2.2 *Methodology for the Case Studies*

The basic objective of the case studies is to produce in-depth qualitative information on the processes and the underlying relations of bargaining, power and negotiation that shape the organization, the outcomes and the impacts of irrigated agricultural production at household level (see original Project Proposal, September, 1992).

The collection of this type of information requires anthropological type of studies: participant observation; semi-structured interviewing; just "being there". A set of guidelines for the collection of data was developed for the case studies.

2.3 *Nepal: The Chhattis Mauja Irrigation System*

A first visit was paid to Nepal by Ms. Margreet Zwarteveen in February/March 1993. During this visit the opportunities and needs for gender related studies in the context of irrigation were assessed. Also, intellectual support was given to two Dutch researchers (Annelies Heijmans and Bert Bruins) who were finalizing a study on gender biases in irrigation projects, with logistical and financial support from SNV Nepal. An introductory lecture on gender and irrigation was presented at the workshop (March, 1993) which was organized to present and discuss the findings of this study with irrigation and WID professionals in Nepal.

An elaborate research proposal for an IIMI study in Nepal was consequently developed. In June, 1993 Ms. Nita Neupane was hired for the Nepal case study. It was decided to conduct the study in the Chhattis Mauja Irrigation System, because IIMI had already collected a lot of background information on the management of this system and because a first visit revealed that a large number of households in the Chhattis Mauja are female headed.

Assistance, guidance and supervision for the study were provided by Ms. Margreet Zwarteveen; Dr. Ujjwal Pradhan (IIMI Nepal); Ms. Jyoti Tuladhar (Centre for Women and Development, Kathmandu) and Ms. Bijaya Bajracharya (Winrock, Nepal).

After a two-week training and reconnaissance period in July 1993 (during a second visit of Ms. Margreet Zwarteveen to Nepal), data collection in the field started and continued until January 1994. Two villages in the command area were selected for in-depth study. The researcher permanently lived in one of the villages, which allowed her to establish rapport with most of the women and men. The more qualitative data were supplemented with data collected through a survey.

First analysis of the collected information and report writing was done in March, 1994 during a third visit to Nepal. The first draft report is currently in the process of being revised.

The Gender Project is also sponsoring a student of Tribhuvan University in Kathmandu (ms. Sujan Ghimire) who is conducting a study on gender and irrigation for her MSc thesis. IIMI has also been invited to participate in a planning meeting of the Ministry of Agriculture to discuss ideas and strategies to address women. Possible follow up activities in Nepal include a collaborative project with the Rampur University, which intends to embark on a survey covering different irrigation systems, studying the involvement of women in agriculture and management. Also, IIMI will contribute to a workshop which is proposed to be held in Nepal on the role of women in irrigated agriculture. This workshop will be organized by the International Commission on Irrigation and Drainage (ICID).

2.4 *Niger: "Perimetres" of Saga and Tillakaina*

A student and a staff member (Mme Dadi Fatima Massalachi and Mr. Kongo Gbiatene) of the Universite Abdoulmoumouni Dioffo de Niamey had, in collaboration with IIMI Niger, conducted two preliminary surveys on the involvement of women in irrigated agriculture in irrigation systems of Saga and Tillakaina. These surveys focussed on female headed households of which the female members owned plots in the irrigation system. It was decided that, in order to get a more comprehensive picture of gender issues in irrigation in Niger, the information collected in these two studies would be supplemented with information on male headed households during a 6 months case study.

Ms. Mirjam Schaap, a consultant from the Netherlands, was hired to supervise and organize data collection, in close collaboration with Mme Dadi Fatima Massalachi, who was also hired by the Gender project. Intellectual guidance and support was provided by Ms. Margreet Zwarteveen and logistical and administrative support by Mr. Kurt Lonsway (IIMI Niger). Field work started in July 1993 and was finalized in November 1993. Although it was originally anticipated that the researchers would spend as much time in the field as possible; this proved not be feasible. After one month in each system, the research team decided to supplement data collection with an elaborate and focussed survey.

Ms. Margreet Zwarteveen visited Niger in November 1993 to assist with data analysis and report writing. A first draft report (in French) was finalized in February 1994. In January 1994 a workshop was organized in Niamey to present and discuss the research findings with a larger audience.

Some of the recommendations that came out of the study will be implemented by IIMI Niger, by Ms. Dadi Fatima Barmou Massalachi. A workplan for the gender activities to be undertaken during 1994 was developed during a brief visit to Niger by Margreet Zwarteveen in May, 1994.

3. GENDER COMPONENTS FOR IIMI RESEARCH

3.1 *Sri Lanka: Participatory Management*

In Sri Lanka, it was decided to initiate three case studies in three different irrigation systems, which were selected to represent the three different Participatory Management Programs that are currently being implemented by the Government of Sri Lanka. The case studies are set up as an add-on study to the "Monitoring and Evaluation of Participatory Management (M&E) Project" which is being conducted by the IIMI Sri Lanka Office.

Discussions on how to best incorporate gender issues in the M&E project started in March, 1993. However, the narrow focus of the M&E project on Farmer Organizations (where participation of women is minimal) limited the scope for making women visible. The case-studies of the Gender Project were set up in order to complement the data collected under the M&E project.

Three researchers and one part-time consultant were hired from July, 1993. The first two months of the study were used to train the three researchers in research methodologies and gender analysis concepts. Actual field work started in September, 1993. The first month was devoted to a reconnaissance survey of the irrigation system under study. This enabled the researchers to select two areas in each irrigation system for further study. Fifteen households in each area are selected for in-depth monitoring during the 1994 irrigation seasons (Maha and Yala). Field data collection will continue, at least until November 1994.

A first Progress Report was written in March 1994.

3.2 *Burkina Faso: the Dakiri Irrigation System*

In 1993 Ms. Clarisse Zoungrana, was hired by IIMI Burkina Faso to conduct a first study on female plottolders in the Dakiri irrigation system. During a visit of to Burkina Faso in December 1993 by Ms. Margreet Zwarteveen, it was decided to elaborate the study so as to incorporate gender patterns of agricultural production in households with male plottolders, and to compare and analyze agricultural performance of female plottolders with that of male plottolders.

In March 1994, (during a three week visit to Burkina Faso) Ms. Clarisse Zoungrana and Ms. Margreet Zwarteveen collaboratively prepared a detailed outline and data collection guide for the additional information to be collected. Ms. Clarisse Zoungrana will be working directly under the Gender project from June, 1994 onward, for a period of 6 months.

4. INFORMATION SERVICES

The objectives and activities of IIMI's new Program on Gender Issues and Irrigation Management were announced in various newsletters and information bulletins. This evoked quite a number of reactions from interested individuals and organizations.

Information received by IIMI on experiences of integrating gender in irrigation projects was summarized in the FMIS Newsletter. First results of the Burkina Faso study were summarized in an article for the IIMI West Africa Newsletter, BRIAO. A lot of organizations and individuals requested (and received) information and advise on gender analysis tools and on strategies to adequately incorporate gender into planned irrigation interventions. Among those organizations are for example: SNV Nepal; ILO Nepal; The Institute of Resource Development and Social Management (Hyderabad, India); ETC; ILRI; IIED. Also, the International Commission on Irrigation and Drainage (ICID) requested IIMI to assist in the organization of a regional workshop on Women and Irrigation, to be held in Kathmandu.

Other information dissemination efforts include: a workshop, which was organized in Niamey, Niger in January, 1994; a seminar, which was held for the Institute of Engineers in Kathmandu, Nepal in July, 1993; a paper on Gender and Irrigation which was prepared and presented at the Workshop "Gender and Water Resources Management. Lessons learned and Strategies for the Future" in Stockholm, 1-3rd December, 1993.

5. REPORTS

During the reporting period, the following reports and papers were prepared, some for internal discussion and use only, others intended for publication as IIMI discussion or research papers, and still others as contributions to workshops or seminars.

Athukorala, Kusum and Margreet Zwarteveen 1994

Participatory Management: Who Participates? Paper to be published in the Economic Review, People's Bank, Colombo, Sri Lanka (see Annex - 1)

Dadi, Fatima Barmou Massalatchi (red.) 1994

Proceedings du séminaire sur "Relations Genre et le Management de l'Irrigation", tenu à Niamey, le 06 Janvier, 1994.

Neupane, Nita and Margreet Zwarteveen 1994

Gender Relations and the Management of Irrigation: The Chhattis Mauja Irrigation System in Nepal. First draft report; final version to be submitted as an IIMI paper.

Schaap, Mirjam, Margreet Zwarteveen and Fatima Dadi Barmou 1994

Relations Genre et Management de l'Irrigation. Cas des périmètres de Saga et Tillakaïna, Niger. First draft report; final report to be submitted as an IIMI paper.

Zwarteveen, Margreet 1993

Some suggestions, tools, concepts and guides for data collection for gender analysis in irrigation. Internal report.

Zwarteveen, Margreet 1993

Gender Issues, Water Issues. A Gender Perspective on Irrigation Management. To be published as a working paper.

Zwarteveen, Margreet 1993

Gender and irrigation in Pakistan: some considerations for donor assisted projects. Discussion paper for the Gender Training Course organized by the Royal Netherlands Embassy Islamabad, Pakistan.

Zwarteveen, Margreet 1993

A gender perspective to irrigation management. Paper presented at the IIMI/IOE Seminar Series on Irrigation Management, 23-07-1993, Kathmandu, Nepal. (See Annex - 2)

Zwarteveen, Margreet 1993

Gender and Irrigation Management: Issues and Challenges. Paper presented for SIDA workshop on Gender and Water Resources Management: Lessons Learned and Strategies for the Future, Stockholm, Sweden, December, 1993. (See Annex - 3)

6. PLANS FOR THE SECOND PERIOD

The main components of the Workplan for the period of May 1994- May 1995 include:

1. To continue data collection for the Sri Lanka and Burkina Faso case studies; to proceed with data analysis and report writing. Appropriate ways for disseminating the information will also be devised (e.g. workshops, seminars, etc.).
2. To finalize data analysis and report writing for the Niger and Nepal case studies; and to publish research findings in the form of IIMI papers and articles. It is proposed that the Niger study be published in IIMI's "Short Report" series. The Nepal findings will be summarized and discussed in the 1994 IIMI Internal Program Review. Study findings will also be presented in a paper for the International Conference on Irrigation Management Transfer to be held in Wuhan, China in September, 1994.
3. To formulate, in close collaboration with national counterpart organizations of the countries where studies were conducted, possible follow-up activities and ways to implement recommendations.
4. To initiate at least one more case study, which will preferably focus more on strategies to better incorporate gender into irrigation interventions. A collaborative action research is currently being developed with the Grameen Krishi Foundation in Bangladesh, which is co-sponsored by Ford Foundation, Bangladesh.

Other possible future activities of the Gender Program may include:

- An Expert Consultation Meeting, aimed at discussing strategies for increasing the gender sensitiveness of irrigation projects and organizations.
- Process monitoring of projects which have adopted deliberate efforts to better address and accommodate gender issues.

7. FINANCIAL REPORTING

Actual expenditure **through** May 1994

	US\$
International Staff Salaries & Benefits	4,927
Consultants	15,469
National Staff Salaries and Benefits	9,807
Supplies and Services	1,761
International Travel	6,636
Contract Research	845
Indirect Cost	13,532
TOTAL	54,093

used to cultivate rice in stages in accordance with the tidal movement of the water, thus staggering their labor inputs. The new pump irrigation system which was introduced required all tasks to be done at one go, which was difficult to realize for the female farmers. While minimizing peak water use was the rationale of planners for timing water deliveries, the female farmers preferred to time water distribution so as to avoid labor peaks (van Hooff, 1990:7/8).

A second set of output measures discussed by Svendsen and Small are the farm management-related measures. Particularly important with respect to gender is convenience, which refers to preference patterns for timing of water deliveries (Small and Svendsen, 1990:396). Women may have some specific wishes with respect to the daily time at which to irrigate, because they have to plan their domestic and productive activities alongside each other. Some of those activities have to be done at a more or less fixed time of the day, like preparing the meals. As a result, women may have a different preference for the time to irrigate or to work on the irrigated field than men. In a small scale irrigated vegetable project in Senegal, for instance, even though a canal system for surface irrigation would have physically facilitated the task of irrigating and would have required the presence of the female farmers in the field only once in a few days, the women preferred a reservoir system which made it necessary for them to go to the fields every day in order to water the crops with watering-cans. An important reason for women to prefer the reservoir system was that it left them free to decide when to irrigate, without having to consult other women (Helsloot, 1990:10). In Nicaragua, there was a marked difference in the time women and men were willing and able to spend irrigating their fields: women preferred to start later in the morning than men, because of their domestic duties they had to perform early in the morning (Blaauw, 1992:60/61).

Night irrigation may be particularly difficult for women, because of social norms which prevent women to go out at night. In Pakistan, the few women that were directly involved in irrigation would send a male relative or neighbor when their irrigation **turn** was at night. If there was no other possibility, they would try to be accompanied by a family member or friend (Basnet, 1992). Also, in Alto Piura in Peru, women complained of the specific dangers they had to face when irrigating at night (van de Pol, 1992).

Of the third set of output measures, water quality related measures, women are more likely than men to place a high value on having access to irrigation water which is clean enough to use for domestic purposes. It has been observed in Sri Lanka that, even though women used the water from the irrigation channels for daily purposes, this water was not considered pure enough to use for ritual bathing and religious purposes (Perera, 1989:90). Also, the health hazard presented by mosquitoes and snails which transmit diseases such as malaria, encephalitis and schistosomiasis (Svendsen and Small, 1990:399) may be felt more by women, since they are often responsible for caring for the sick.

3.4 Gender specific needs with respect to the process of irrigation management

Because addressing and accommodating gender concerns in irrigation can be expected to be more successful when user concerns are addressed and accommodated, and because of the many efforts all over the world to better and more involve users in irrigation management, the focus in this section will be on the potential gender differences with respect to participation in users' organizations. Looking at attempts to increase users' participation in irrigation management from a users' perspective means looking at whether and where men's and women's participation is desirable and possible. This will ultimately depend on how women and men evaluate the possibility of meeting their needs with respect to irrigation through formal participation, and it will depend on how irrigation professionals think that male and female users' involvement contributes to the overall performance of the irrigation system.

Evidence shows that if users' priorities are taken into account at all in irrigation management, the users' group will usually be thought of as consisting of men only. This is a reflection of the assumption that each farm household is benevolently headed by an adult male, who is able and willing to take all decisions on behalf of his dependent family members. The few irrigation management studies that focus explicitly on women reveal that in most cases women are virtually absent as official members of irrigator's associations. The most important reason is that membership is confined to either official landholders or heads of households. Both criteria far more often apply to men than women. Only in cases where men are not or hardly involved in irrigated agriculture, women will be officially involved in water users' associations.

Is it necessary to involve women in water users' organizations? The answer to this question will be different for every specific situation. It will depend on the nature and degree of women's involvement in irrigated agriculture and operation and maintenance tasks. It will also depend on the nature of the specific needs women may have with respect to the irrigation systems' outputs and impacts. In some cases improving women's involvement will directly lead to a higher performance of the irrigation system. This was for example observed in Indonesia, where men were engaged in off-farm activities for large periods of the year. Women were almost entirely responsible for the agricultural activities, including irrigation. However, the water users' organization consisted of men only. This led to inefficiencies in water distribution (Schrevel, 1989). In Nepal, in the Baurahua irrigation system in the Terai, the absence of women in the pre-seasonal planning meeting also led to inefficiencies in water distribution: female farmers were sometimes not aware of their water turns. Acknowledging this, male farmers took the initiative to invite women as well to the meeting (Bruins and Heijmans, 1993).

Women themselves, even though they have an obvious interest to do so, will not always be very eager to participate in male dominated organizations and gatherings. They may feel insecure or they may lack confidence in meetings with men. Organizations and meetings are often associated with political matters, or with the public domain, which

is not where women normally would go to solve their problems. In Sri Lanka, female heads of households prefer *to* send a male relative to water users' meetings, instead of going themselves. Or they may **ask** a male neighbor to represent their interests.

Women may have alternative ways to influence decisions with respect to the management of the system. In the Chhattis Mauja in Nepal, female heads of household were successful in reducing the fine that had to be paid when not doing maintenance work. In another area of the Chhattis Mauja, women convinced the irrigation organization to alter the rule which only allows men to participate in maintenance task; They convinced the male members of the organization that they could do maintenance works as well.

These, and other examples show that the effectiveness of users' organizations may not always be very high for women. Women will often differentially evaluate **the** costs and benefits involved in participating in users' groups. The attractiveness of participation may be less for women, because the costs and time spent for travelling to or attending meetings may be relatively higher for them, but also because norms and values are not always supportive of women engaging in public matters. Qualities for being an active and vocal member of irrigators' groups may be valued in men, but considered inauspicious when found in women.

4. How to make irrigation and its management more gender sensitive?

There is no magic formula as to how to devise more gender sensitive irrigation policies and interventions. A first step, however, towards a gender perspective to irrigation management is to erase the stereotype picture of the farm household all of us have in our minds. When we think of farmers, water users or irrigators, we automatically think of men. The reality is that the irrigation world, at least at the users' level, consists of at least as many women as men. And the reality is that female water users do not always and automatically have the same perspectives, priorities, ideas and needs as male water users.

To recognize that gender based differences, which influence the way an irrigation system is used, exist implies that women, as well as men, need to be consulted when decisions are to be made regarding new irrigation institutions or facilities. Consulting with women will often require an extra effort: women may not be used to be asked about their opinions, they may be too busy to talk at length with outsiders to discuss alternatives. Women may not feel as confident in discussing matters that have always been discussed among men. Social norms and values may inhibit women to talk freely to male outsiders; which implies that female irrigation professionals need to be available to consult with women.

An extra effort will thus often be needed to elicit the opinions and views of women. This does not mean that it is very difficult to approach women. Participatory research approaches have been developed which provide strong and easy to use tools for getting female and male users to express their needs, priorities and interests. And while women may be a little shy, or feel inconfident at first, evidence shows that once women understand that they are offered with an opportunity to decide on matters that will influence their lives, they come up with a lot of suggestions and ideas. Women often have very detailed and specific knowledge about their natural and social environment; and their knowledge is often different from that of men.

To enhance female participation in users' groups may likewise involve a special effort. Men often have much more experience in conducting and attending public meetings, they know how to express their opinions and how to voice their concerns in a big gathering of people. Experiences in Indonesia and Nepal show that women can be trained to participate on an equal basis with men in organizations and meetings. In Indonesia, female water users were at first organized separately from male water users. In a latter stage, the women who were trained felt confident enough to become members, and even office bearers, of the official water user organization. In Nepal, female water users said that they needed literacy training in order to be able to participate in water users' organizations.

Past experiences with Women in Development projects show that it is often difficult for irrigation professionals to conceive women as producers, water users or irrigators. Many WID projects in the context of irrigation have focussed on smallscale side activities for women outside of the irrigation domain. Women are most easily perceived as mothers and domestic care takers; people who are not yet gainfully employed and therefore need some hobby-like activity to keep them busy and happy. The challenge for irrigation professionals is to realize that most women already are gainfully employed, and that their activities in fact form a crucial and integral part of the irrigated agricultural production system.

ANNEXES

Participatory Management: Who participates?

Kusum Athukorala and Margreet Zwarteveen

The Gender Program of the International Irrigation Management Institute (IIMI) is currently undertaking a study which examines, among other things, some of the constraints to female participation in Farmer Organizations. To this end, IIMI's Gender Program is conducting detailed field studies in three sites - Rajangane, Mahaweli System II and Gampola Raja Ela- which were chosen to include the three Participatory Management Programs which are currently being implemented in Sri Lanka: Management of Irrigation Schemes (MANIS), Integrated Management of Major Irrigation Schemes (INMAS) and Mahaweli. Some first findings of these studies will be presented here.

The success of all three Participatory Management Programs in Sri Lanka stands or falls with the development of strong and competent Farmer Organizations (FOs). FOs are expected to assume part of the responsibilities and costs of operating and maintaining irrigation infrastructures, in return for which they should get a better, more reliable and more equitable access to irrigation water. The question this brief article aims to address is to what extent strong FOs, which represent the needs and interests of the main end users of irrigation services, can be expected to emerge when women are inadvertently excluded from participation.

1. What are the constraints to female participation in FOs?

In all of the three irrigation systems under study, there is limited participation of women in FOs. Membership of and participation in FOs is confined to just one member of every irrigating household, and when there is a man in the household he will most often be the one to participate. Although family members are usually allowed to represent the landholder at FO meetings, in practice women rarely represent their male relatives. Women who do not have a man (husband or son) in the household sometimes do participate, but their participation in meetings is often less active than that of men. Female participants in meetings have been observed often to remain silent. The exceptional women who are actively involved in FOs are women who have already gained some status in the community, through relations or through a reputation for hard work in other community organizations. Usually these women are older, they have grown-up children and are less burdened with household tasks.

The main reason for the absence of women as active participants in FOs is that the legal recognition of irrigator status tends to be reserved for men, except in those cases where women are heads of households. Participation in users' organizations is often confined to persons holding landtitles, having official irrigator's status or to "the head of the household". All three qualifications far more often apply to men than to women.

In Sri Lanka, the question of who should be the members of FOs has hardly been given any thought. It has been automatically assumed that the "farmers" who are to form the FOs are men, since both farming and irrigation are conceived as all-male affairs. Training and awareness building programs are usually directed solely at male farmers. Women only come into the picture as "helpers of their husbands", irrespective of how much time and other resources women actually devote to irrigation and irrigated agriculture and despite of a growing body of literature documenting the important roles of women in irrigation systems in Sri Lanka (e.g. Lund, 1978, Schrijvers 1986, Kumar 1990, Rajapakse, 1989, IIMI, 1992).

Another reason for low female involvement in FOs may be that organizations like FOs are projected as public organizations which are associated with male roles rather than with female roles. Very few of the women without male members in the household, who officially are members of FOs, do attend meetings and when they do they often remain rather passive. The fact that FOs are dominated by men in itself may pose a barrier to women to participate in a more active manner, as they are seen to be participating in other community organizations.

2. Who are the main users of irrigation systems?

When FOs are to be organizations which adequately represent and address the needs and interests of the main end users of irrigation services, then all the main end users should be involved in FOs.

Implicit exclusion of women as FO members can thus only be justified on the grounds that (1) women cannot be considered users of irrigation systems or that (2) decisions made by men adequately reflect an intra-household consensus.

The studies show that, especially in the Dry Zone irrigation systems, women are involved in many tasks in irrigated agriculture. Also in the Dry Zone, a relatively large number of households (20% or more) are headed by women, who therefore are solely responsible for all household and agricultural activities. In male headed households, at the household level women also assume a large share of the farming responsibilities; not only by working in the fields but also by mobilizing "attam" (labor sharing) groups, supervising hired laborers, managing agriculture related family enterprises and by organizing finance for agricultural purposes from various sources. Financial management of household and farming activities is often seen to be handled by wives and daughters. Many women perceive one of their roles as needing to ensure financial and food security, especially in times of stress.

Female tasks and responsibilities are quite distinct from those of men, although many tasks are carried out by women as well as men. Although the amount of time women and men dedicate to activities related to irrigation and irrigated agriculture vary with the economic status of a household, on average women spend as much or more of their time

to irrigation related tasks as men. Women are even involved in tasks that are traditionally thought of as strictly male; in Rajangane and in System H of the Mahaweli women can for example be found levelling, making bunds and irrigating. Traditionally women were constrained from entering the threshing floor due to ideas of ritual pollution - nowadays, in the Dry Zone, because of economic necessity, women do undertake work related to threshing.

As a result of the policy emphasis on Other Field Crops (OFCs), the participation of women in irrigated agriculture has dramatically increased. In the study sites, the major responsibility for OFC cultivation is with women. Both male and female farmers accept that OFC cultivation depends for a large extent on women.

Contrary to common belief, preliminary observations also show that women are actively involved in on-farm water management. Those wives and daughters who are heavily involved in irrigated agriculture discuss with neighboring farmers about water rotation schedules. Interviews with men and women seem to indicate that women are more concerned about equity of water distribution than men. Women explain this by stating that "it is difficult to live with a neighbors' poverty". Many women also actively participate in canal clearing and desilting operations carried out by FOs as part of ongoing maintenance of irrigation systems.

In the Dry Zone irrigation systems under study, it is found that there are many households where women are forced to take on more farming responsibilities because of the high rate of alcohol consumption by male household members. It is estimated that at least 30% of the men in Rajangane and System H of the Mahaweli are heavy users of alcohol. On the one hand, alcoholism can be seen as an indicator of problems of poverty and distress. On the other hand, alcoholism is a serious drain on a household's labor and financial resources, creating problems which remain to be resolved by women.

The fact that men and women have distinct responsibilities with respect to irrigated agriculture implies that women have specific knowledge about irrigated agriculture and specific needs with respect to irrigation. This in itself would justify some sort of female involvement in FOs, unless of course men do adequately represent women's concerns at meetings. The field data do not support such a hypothesis. Although there are some farming couples who make most of the farming decisions together, in many households men and women have different objectives and perspectives.

When asked directly, both men and women have a tendency to point at the men as the main provider and decision maker. However, this seems to reflect cultural desirability rather than actual practice. In quite a number of households, women are much more aware about the financial aspects of farming and many women are the ones who try to economize. Women, even those from very poor families, try to have some savings which they often conceal from their husbands, to be used in emergencies such as illness.

3. Do women want to become FO members?

When asked directly whether or not they would like to become more actively involved in FOs, some women (both those with husbands, as well as those without husbands) reply that they do not see the need to participate. This does not so much indicate a lack of interest by women in irrigation related matters, as it is the outcome of their assessment of the costs and benefits of FO participation. Some FOs are still in the development stage, and with a few exceptions the real benefits of FOs are not yet very clear to most of the people involved. The enthusiasm of both men and women with respect to ideas of Participatory Management is dictated by what they perceive as the level of responsiveness of the FO to their problems. Some women for example state that they do not have the time, or that the family budget cannot afford the loss of wages entailed by participation in the FO.

In Gampola Raja Ela, a MANIS system, most people are hardly aware of the Participatory Management Program. Here, the basic reason for many men to become members of FOs is the prospect of involvement in construction work connected with the ongoing irrigation rehabilitation program. In Rajangane and Mahaweli System H, most men and women have some idea about what the objectives of FOs are, and most are quite positive about it. However, many consider the costs of participation to be high. In System H of the Mahaweli, groups of people organize themselves and assign some representatives to attend meetings, instead of all of them going. Many women, when asked, say that they usually ask their husbands, neighbors or relatives to tell them about what happened at meetings. This is why many women do not feel a need to actually attend FO meetings themselves, especially in view of their numerous domestic and productive tasks. If women have any problem they want to bring to the attention of irrigation officials, they usually try to request an FO office bearer to represent matters at the FO meeting. Alternatively, women try to meet directly with officials: according to one of the Mahaweli Economic Agency officers interviewed, most of the complaints and problems brought to him for action are presented to him by women.

Women and men appear to perceive the FOs in a slightly different way. Although both of them are happy with the official recognition gained through involvement in FOs, most women expect that membership of FOs will improve communication with the irrigation officials. They anticipate that this in turn may help them to quickly find solutions to problems related to irrigated agriculture. Men have a tendency to associate FOs with other public organizations, and define their own involvement as "doing a social service to the community". In addition to expecting FOs to be a problem solving mechanism, many male office bearers are also concerned about their increased social and political status associated with their position in the FO.

Most women find it hard to picture themselves as active participants in FOs, though some female landholders resented their little involvement by wryly commenting that they are only asked to "work for shramadanas and provide tea and kiribath". Although there are

a few examples of very active women working as FO office bearers at both Field Canal and Distributary Canal Level, most women tend to consider FO matters as belonging to the male domain. The high involvement of women in other community organizations, such as Funeral Assistance Societies, Sanasa groups and *seettu* groups (informal saving groups), indicates that women are capable of and interested in assuming community responsibilities. Because of their limited time and resources, women in irrigation systems need to see a direct relevance of their involvement in organizations to the advancement of the family.

Although many of them are not directly involved, women are seen to be influencing FO decisions through discussions with men at the household level. For example, in the study areas, some wives of male office bearers were found to be the driving force behind their husband's involvement in the FO. Those women actively urge and support their husbands to assume their FO responsibilities, and often they help their husbands with whatever administrative or organizational work that needs to be done as a result of his position in the FO. However, in cases where the benefits of FO involvement are not directly apparent, wives perceive their husband's FO involvement as a barrier to the economic advancement of the family and try their utmost to limit the time spent by their husbands on FO activities.

4. Conclusion

The intensive observations of the Gender and irrigation study have served to highlight several areas regarding women's roles and involvement in irrigated agriculture which have hitherto remained invisible.

As a result of confining membership of and involvement in FOs to men the flow of information and other services to and from irrigation agencies is mediated through male farmers. This reflects the implicit idea that decisions made by men adequately represent an intra-household consensus. The study shows that this is not always the case; women and men, because of their distinct roles and responsibilities within the household, have different ideas, interests and needs.

Irrigation, irrigated agriculture and irrigation management tend to be thought of as all male affairs. The study shows that this is an inaccurate perception of the reality in irrigation systems. Because of their high involvement in field activities as well as decisionmaking, women as well as men can and should be considered an interest group in irrigation systems.

Without actively promoting and facilitating women's involvement in FOs, women risk to become marginalized from decision making processes that directly affect them and their families. At the same time, the process of Participatory Management could benefit from the specific knowledge of women about irrigated agriculture and capitalize on their recognized community roles and experiences as managers.

In order to optimize agricultural production and to ensure that the potential success of Participatory Management is fully realized, factors constraining female participation in FOs need to be addressed. The inadvertent projection of FOs as predominantly male organizations has made women feel, even when they do sometimes attend meetings, diffident about their participation. FOs need to be perceived as community based organizations which are responsive to the needs and requirements of all stakeholders, irrespective of gender. Training and awareness programs should be geared at helping women to better understand and share in the potential benefits of FO involvement. What is needed is a genuine commitment and a focussed effort to make women's participation a reality in the planning and implementation of Participatory Management Programs.

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A gender perspective to irrigation management

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IIMI/IOE Seminar Series on Irrigation Management
23-07-1993, Kathmandu Nepal

1. Introduction

When working in the Department of Irrigation at the Wageningen Agricultural University, a professor who had just given a seminar was asked by someone in the audience why he had not made any reference to women in his presentation. The professor was silent for a few seconds, and then said "I only pay attention to women in my spare time".

Of-course this professor meant to make a joke, even though it was a sick one. **Still**, his answer reveals the attitude of many irrigation engineers, who feel that their job is merely a technical one. They deal with water, with hydraulics and hydrology, with canals, structures and crop-water requirements. They do not deal with people, and certainly not with women. Women? Women are their mothers, wives, their girlfriends and daughters. Women belong to the personal domain and not to the professional domain.

Although gender is thus a relatively new and often somewhat strange topic for irrigation professionals, irrigation is well known to many WID and gender professionals. Why is this? Irrigation projects, and particularly irrigation settlement projects, provide some of the most striking examples of project failures caused by the failure to recognize and accommodate gender issues.

Several studies in Africa (e.g. Dey, 1990; Carney, 1988; Jones, 1986) show how women, as a result of new irrigation interventions, have lost access to land and to the proceeds of harvests in favor of their husbands and male relatives. While women were expected to contribute their labor to the newly irrigated crops controlled by their husbands, they often did not equally and fully share in the benefits. In some cases **this** led women to withdraw their labor and to search for income generating avenues of which the benefits would accrue to them.

In Sri Lanka, in the Mahaweli Ganga Irrigation System, it was found that after the system had been in operation for a number of years, the rate of undernutrition in the system was one of the highest in the whole of the country. One contributory cause was the lack of opportunities for women to gain some individually controlled income, or to grow individually controlled crops. The income from the sale of paddy was given to the male farmers, who sometimes spent this income on their individual needs, rather than on the needs of their families (Schrijvers, 1985).

2. Gender and gender analysis

Attention to gender in the context of irrigation arises from two basic concerns. The first is a concern with the ineffectiveness and inadequacy of technologies and institutional choices as a result of the neglect of gender considerations. This concern stems from the recognition of the important roles of women in both productive and reproductive activities. Women often perform many more tasks and are much more involved in agricultural activities than is generally assumed and reflected in official statistics. The success of policies and interventions aimed at raising the levels of agricultural production, or at alleviating poverty, depends for a large extent on identifying and addressing the appropriate target group. Just as there is a need to differentiate between large and small farmers for purposes of policy and project implementation, similarly there is a need to distinguish between the roles of women and men in agriculture.

The second concern is with the differential impact of development strategies and interventions on women and men. It has become clear that in many cases women have not benefitted equally from development efforts. In some cases women have even become worse off. Studies arguing that economic development and technological change are not indifferent to the already existing class and gender inequalities and often tend to reinforce those, have shown how women have gradually and systematically lost access to and control over resources in favor of their husbands or male relatives.

There is one additional reason to justify attention to gender in any agricultural development effort. This is the almost worldwide trend towards a feminization of agriculture. The declining profitability of agriculture leads men to migrate, either permanently or temporarily, to towns or abroad to earn a cash income. **As a result**, all agricultural tasks and decisions become the responsibility of women.

What do we mean when talking about gender? Gender refers to the socially determined roles of men and women. Gender roles are learned, are variable across and within cultures, and change over time. Unlike earlier approaches, a gender approach does not focus solely on men or on women, but on both men and women and on the relations between men and women within households and within society as a whole.

Gender analysis in agriculture is the systematic effort to document and understand the roles of women and men within agriculture. The key issues in any gender analysis effort are the division of labor; the access to and control over resources and benefits; and the social, economic and environmental factors that influence the first two. Two basic assumptions underly every gender analysis effort:

1. Every policy or intervention ultimately stands or falls with the willingness and ability of the direct users to spend their time and resources;
2. Farming, almost everywhere in the world, is primarily a family affair.

Gender analysis in agriculture basically consists in asking three related sets of questions:

- (1) Activities analysis; or who does what, when and where? These questions are concerned with what tasks are performed by men, women and children which contribute to farm production, to household production, to child-bearing and rearing, and to other productive activities including off-farm activities. The activities analysis reveals periods of labor shortage and identifies all competing tasks by gender, not just those in farm production.
- (2) Resources analysis; or who has access to or control over resources for production? By control is meant the power to decide whether and how a resource is used, how it is to be allocated access refers to the freedom or permission to use the resource. For example, "where men have control of livestock or traction, their wives and female relatives may obtain traction services from them. Women have access to traction, but men have control of it. Where women keep the cash and make decisions about expenditures, women have control of cash, men have access to it. The question of access to and control of land can be confusing, but is also illustrative. For instance, in the case where land is allocated by a senior male, but decisions about what to plant are left to the person to whom it is allocated, one would argue that both adult males and adult females have access to land (with some indication that female access is through males); and that both have control of land, but that male control is greater (allocation and decision making on use) than female control (decision making on use only)" (Feldstein and Poats, 1990:16).

Resources include land (and the terms on which it is available); capital, including cash, tools, and livestock for production or traction; labor (one's own, family/children's, others'); other inputs, including seed, fertilizers, and pesticides; services such as credit and education; and knowledge.

- (3) Benefits and incentives analysis; or who benefits from each enterprise? Benefits analysis refers to who has access to and control of the outputs of production. This include all the end uses of a product, for example of a crop: home consumption, sale, income from sale, fodder, compost, crafts, building materials, etc. Benefits can also refer to changes in the farm labor process, such as reduced labor demands or reduced risks. It also includes the output of alternative or competing enterprises. The extent to which individual household members benefit, or expect to benefit, from activities will partly determine their willingness to invest their time and resources in these activities. Women may, for example, be willing to increase their labor contributions to irrigated crop production when they benefit from increased yields or incomes. However, whether or not they will actually do so **will** also depend on their roles and responsibilities, as well as their control over resources. Is the extra work compatible with their other tasks; does their husband allow them to work longer hours in the field; do they have the know-how and **skills** to perform the specific tasks concerned? Incentive analysis deals with these

questions. It is the analysis of preferences which underlie farm household members' incentives to continue or change what they do.

3. Towards a gender perspective to irrigation management

Trying to develop a users' perspective to irrigation management means trying to find out where and how male and female water users' needs are compatible with the objectives of the irrigation system. Again, the basic premise here is that unless the direct users are willing and able to use the water delivered by the irrigation system efficiently and effectively the objectives of the irrigation system will not be realized. Hence, the project of developing a gender perspective to irrigation management basically consists of answering the following questions:

1. What are the objectives of the irrigation system?
2. What are the needs of female and male water users?
3. To what extent are (1) and (2) compatible, or: In what ways can we, as irrigation professionals contribute to accommodating the irrigation system to the needs of female and male water users?

3.1 Defining the objectives of an irrigation system

Defining the objectives of an irrigation system in itself is a controversial and difficult matter. Different parties involved will have different priorities and different interests. Among the many objectives irrigation is expected to realize, are for example: increasing agricultural productivity; increasing political stability; decreasing poverty; achieving national food security; etc.

WID or gender advocates may add an additional objective to this list, which is that irrigation needs to contribute to the well-being of women, or even that irrigation has to lead to the empowerment of women.

Unfortunately all these objectives can seldomly be achieved at the same time. A high productivity at the irrigation system's level does not automatically mean that all households who are involved in irrigation benefit from it, or benefit to the same extent. Nor does a high productivity or income at the household level always imply that **all** the household members have equally contributed and equally shared in this income.

There is no way in which all the different objectives and interests of the different parties involved in irrigation can be easily matched, or that potential conflicts of interests can be easily solved. However, to realistically plan and implement irrigation interventions it is crucial to realize that differences and potential conflicts exist. This recognition begins with bringing some consistency in the various levels of goals and objectives.

Mark Svendsen and Leslie Small (1990) have developed a framework which helps to see how the different goals and objectives of irrigation systems are interrelated. They define an irrigation system as a set of physical and social elements employed to acquire, convey and distribute water to fields and disperse it to the root zones of crops. The output of this system (water delivered) becomes a major input into the next level, the irrigated agricultural system, the outputs of which (crops) are the input into the agricultural economic system.

Parallel to these "levels" of performance one can distinguish organizational levels in an irrigated agricultural system. Bos et al. (1993) distinguish three functional levels: **the irrigation sector**, i.e. policy makers and planners usually located in ministries; the **agency level**, i.e. larger institutions responsible for allocation and management of goods and services in support of the farmer community; and the **irrigation system level**, i.e. the organization responsible for management of a physical system for allocating and distributing water. Broad objectives are set at the **system level** which (in principle) are turned into **specific targets** at regional or district levels by the macro-level agency; these in turn are the basis for specific targets at system level that presumably reflect objectives at the agency level (Bos et al., 1993). The organizations operating at these various **levels** supply services to a range of "customers" or stakeholders. These include the direct water users, but irrigation agency employees may also be considered stakeholders. People more indirectly affected by the irrigation system, like agricultural wage laborers or consumers of the crops produced, or traders can likewise be viewed as stakeholders (Ibid., 1993).

The focus here will be on the most direct and obvious stakeholders; farm households. However, households are not just receivers of irrigation system's services. Farm household members 'transform' the irrigation water into agricultural products by skillfully coordinating their labor, knowledge and other resources. In many instances, farm household members are also directly (either formally or informally) involved in allocating and distributing the water, as well as in the organization of and collective decisionmaking regarding these tasks. The nature of women's and men's needs with respect to irrigation and their assessment of the possibility to satisfy these needs will determine their willingness to invest labor and resources to irrigation and irrigated agriculture. Therefore, the level of satisfaction of female and male members of households using irrigation water is not only one important measurement of the effectiveness of irrigation systems (cf. Bos et al., 1993), it also is one important factor determining its effectiveness. Unless water users employ their own labor and capital in a way which makes good use of available and anticipated land and water resources, the ultimate benefits of irrigation will be restricted.

Although many differences may exist between the users of an irrigation system (based on land size; ethnicity; age; etc.), the focus here is on potential differences between male and female water users. Usually, if users' needs are taken into account at all, these are most often the male water users' needs. Women are often not considered, but there is

enough evidence to substantiate the belief that they have specific needs with respect to irrigation. Women's needs are not necessarily conflictual to those of men; they may be complementary or shared.

Following the Small and Svendsen framework, gender specific needs with respect to irrigation can be identified for the system's impacts, its outputs and for the process of irrigation management.

3.2. Gender specific needs with respect to the impacts of irrigation

Gender needs with respect to the direct impacts of irrigation will evolve around

1. The allocation of labor, land, water and other resources to the cultivation of crops; to construction and maintenance activities and to participation in users' organizations and meetings.
2. The use of the outputs of irrigated agricultural production, e.g. consumption, storage for use, later exchange or later sale.

The identification of gender differentiated impacts not only is an indication of how women and men differentially benefit from irrigation, it also explains why women and men are differentially motivated to invest time and resources to irrigation and irrigated agriculture. In the African examples given earlier, women completely lost interest in cultivating irrigated crops since they felt that their extra labor contributions were not compensated by additional benefits or gains. Examples from India and Sri Lanka show that men not always share the income from irrigated agriculture with their **wives** and families.

The less visible and indirect impacts of new irrigation opportunities may **also** be gender specific. Women in the hills of Nepal were highly positive about new irrigation facilities, since these considerably reduced the time they need for fetching water for domestic use. In India, the unforeseen positive impact of canal irrigation on the growth of fodder was particularly beneficial for women, since it enabled them to increase their **milk** and ghee production. The opposite effect may occur with groundwater irrigation, which may lower ground water tables and thus reduce the growth of weeds used for fodder, or the growth of trees used for fuel wood and fodder. This occurred in Bangladesh, where the shortage of fodder and fuel increased the time especially poor women spend gathering fuel and fodder. It gradually pushed them towards more and more marginal sources, such as leaves and bark of trees, which hastens further deterioration of natural resources.

3.3 Gender specific needs with respect to the outputs of irrigation

Some of the differential interests and needs women and men may have with respect to the impacts of irrigation are reflected in the way women and men evaluate the direct outputs of the system. How do users evaluate the outputs of irrigation system? First of all they can be expected to be concerned with the amount of water delivered, or the adequacy of water deliveries.

Are women and men likely to differentially evaluate the adequacy of water deliveries? In many situations, the main irrigated crop will be controlled by the male farmer. Women often contribute labor to the cultivation of this crop, but very often they will also grow crops of their own. These crops may be used for own consumption, or they may be sold providing women with a source of individual income. When there **is** an opportunity of doing so, women will make use of irrigation water in growing these crops. They may take water directly from the channels, or sometimes they use drainage water. In Burkina Faso and Niger, specific plots were allocated for use by women. Since crops grown by women are not considered being the 'main' crops, or because it is not even realized that they are grown, their water requirements are seldom taken into account when devising water delivery schedules. In some cases, the use of irrigation water for growing crops other than the planned one, or for using water on plots outside the designed command area, will even be considered illegal. The fact that most interactions between managers and farm household members take place with men obviously contributes to women's water needs going unnoticed.

Gender differences in irrigation needs with respect to adequacy may also occur as a result of a gender division in tasks. Water can substitute labor, like for example in the case of pre-season applications to soften soil for land preparation (Svendsen and Small, 1990:393). Land preparation is often done by men, which means that pre-season applications reduce the amount of male labor needed. Women may be expected to do the bulk of weeding in paddy cultivation. Unless they work as paid laborers, women are thus likely to be in favor of increasing the ponding depth which reduces weed growth. In Nepal, women reported that the increased availability of irrigation water had considerably reduced the time needed for weeding. For the same reason of reducing the amount of their labor needed, women may prefer that rice be broadcasted instead of transplanted. In Sri Lanka, like in many other Asian countries, transplanting is done by women and it is a physically very demanding task. Broadcasting is most often done by men. Water requirements in terms of amount of water needed, as well **as** in terms of the timing of water deliveries are different when rice is broadcasted instead of transplanted.

A second measure users may use to evaluate the outputs of an irrigation system is equity. Equity refers to the spatial distribution of water across the irrigation system. When water is short, both farm households and managers will have to address the question of how to distribute the available water among plots and farm households. Equity then becomes a measure of fairness of the allocation of the shortage. **It** is obvious

that notions of fairness will depend very much on existing social and economic differences and power hierarchies. It may be considered fair that an influential farm leader receives a relatively larger share of water, for example. Also, farm household members may take local differences in soil-moisture holding capacity or seepage and percolation rates as valid reasons for differences in water deliveries (Vermillion, 1990:138).

A first and very direct gender difference with respect to equity may be that, justified by existing gender ideologies, female irrigators receive less water than male irrigators. This gender discrimination in water allocation will often not be very direct and open. It may for example be that crops grown by women may be considered less important and therefore receive less priority when water is allocated. Female heads of households in Nepal felt that they received less water than men. Because they were not supposed to participate in agricultural planning meetings, water allocation plans were made in their absence (Bruins and Heijmans, 1993).

Considerations regarding equity may also be valued differently by women and men because of differences in the nature and importance of social relations to men and women. In Nepal,

in Bhanjyang Tar Ko Kulo (canal) the head reach people initially took much interest in the improvement of the head reach section of the canal, but they were not concerned with the improvement of the tail reach because of local politics. There was a critical section in the canal from which most of the water leaked, requiring improvement if the tail end people were to receive reliable water. Some women from the head reach said to the head reach male farmers

that "if you do not further improve the canal, we females will do the job." This embarrassed the male farmers, resulting in further improvement of the canal in the tail end (Pradhan 1989:52).

Investments in extra-household social relations and networks may carry a specific significance for especially poorer women on at least two grounds. They tend to be more disadvantaged in relation to other more tangible forms of resources (see for example White, 1992). Furthermore, it may offer women a measure of autonomy from male authority within the household and can help furnish them with powers of persuasion in their dealings with men (Kabeer, 1992:12). It may therefore be that women place a higher value on fairness of water distribution than men do.

Different appreciations of timeliness, which relates to the distribution of water across the season relative to some utility-based standard (Svendsen and Small, 1990:395), may again arise because of a division along gender lines between crops. Potential gender differences may also occur because of male or female labor peaks; the availability of labor being the standard of utility used. In traditional swamp areas in Gambia, for example, women

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**Gender and Irrigation Management:
Issues and Challenges.**

Paper presented for SIDA Workshop on

Gender and Water Resources Management:
Lessons Learned and Strategies for the Future

Stockholm, December 1-3 1993

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1. Introduction

Irrigation projects provide some of the most striking examples of the failure to recognize and accommodate prevailing gender based patterns of agricultural production. This failure has negatively affected the overall success of projects, and has led to a deterioration in the position of women.

Examples show how women lost access to land and to the proceeds of harvests in favor of their husbands and male relatives. While women were expected to contribute labor to the newly irrigated crops controlled by their husbands, they often did not equally and fully share in the benefits. In some cases this led women to reduce their labor contributions to irrigated agriculture and irrigation in order to search for income generating avenues of which they were sure to control the benefits. In examples from Africa, the lower than anticipated availability of female family labor depressed overall yields and the size of the area cultivated. In places where alternative income generating avenues were not available to women, women's lack of control over income reduced their capacity to feed their families (see for example: Hanger and Moris, 1973; Dey, 1990; Carney, 1988; Jones, 1986 and Schrijvers, 1985).

While irrigation projects have gained a reputation for poorly conceiving gender relations, and while most gender professionals are quite familiar with irrigation examples, still very few successful gender sensitive alternatives to irrigation planning, design and management have so far been developed. Nor have any meaningful attempts been devised to redress inefficiencies and inequities caused by gender biases in existing irrigation schemes.

Efforts to address gender questions in irrigation systems remain limited and marginal. Many focus on small scale income generation projects for women outside of the irrigation domain. A typical example is that of an envelope making project for women in the Mahaweli Irrigation System in Sri Lanka. When buyers for the envelopes manufactured by women did not immediately show up, a director of the irrigation agency involved generously decided to buy all the envelopes himself (Sumanasekera, 1993).

The attribution of a very small plot within the irrigation system to groups of women, where they can collectively grow vegetables, is another well-known and widely adopted strategy of irrigation planners to comply with donor requirements to pay attention to gender. In a Burkina Faso irrigation project, all the newly irrigated land was allocated to men, while their wives performed at least half of the agricultural tasks in addition to working on their individually owned rainfed plots. Despite of their labor contributions, women were not formally involved in the cooperative organization of the irrigation system. Rather than addressing women as co-farmers and direct stakeholders of the project, a separate project for women was envisaged. Three thousand women were organized in groups of around forty. The women received as little land as 12 ha, or 1% of the total command area, to be used for the cultivation of vegetables (van Koppen, 1990).

A striking feature of most **of** the WID (Women in Development) or gender strategies in irrigation contexts is that women are merely addressed as housewives, who have to be assisted to be gainfully employed. Projects are often very small and receive minimal financial and institutional support in the form of planning, technical assistance, supervision and monitoring. While the little these projects achieve might be positive in itself, little is done to remedy gender distortions in irrigation planning, design and management. Solutions to gender biases in irrigation planning, design and management are sought outside the irrigation domain, while the biases themselves remain uncriticized.

The easiest explanation for the little **success** of attempts to incorporate gender into irrigation planning, design and management is male resistance. Most irrigation professionals are male and it **is certainly** true that many suffer from gender blindness. However, while it is true that irrigation planners and engineers seem to make few real efforts to address and accommodate gender, gender professionals have also done a poor job in making themselves understood by irrigation professionals. Irrigation professionals and professionals dealing with gender related issues speak completely different languages, they have different objectives and they have entirely different conceptions of the reality of the irrigation world.

The objective of this paper is to identify the intersections between irrigation approaches and gender approaches. It will be argued that attempts to make irrigation engineers and managers (and consequently their policies, programs and projects) more gender sensitive are deemed to fail when gender interests and needs are not translated into water terms. The **task** of gender specialists is not limited to pointing out how and where irrigation projects have (negatively) affected women; they also have to provide creative and workable solutions and alternatives that can be easily understood and adopted by irrigation planners and managers. At the same time, a gender perspective to irrigation management may lead to a reassessment of irrigation goals and objectives, as well as of the strategies to reach these objectives.

2. Irrigation management

2.1 Irrigated agriculture

From the mid-1950s irrigation was widely perceived to be the number one solution for meeting the world's growing food demands. Huge investments in the creation of new irrigation facilities resulted in a tremendous increase in the world's stock of irrigated land. By 1989, there were some 233 million ha of irrigated land in the world; 73% is in developing countries, representing 21% of all the cropped land in these countries. It is estimated that about one third of the global harvest of food crops comes from irrigated agriculture (Samad et al., 1992).

The spread of irrigation, or the expansion of irrigated areas, has been a major contributor to the remarkable increases in agricultural output in developing countries. The rapid increase in irrigated areas is unlikely to be repeated; the best sites are exploited and the cost of new projects in poorer sites rises disproportionately.

While there is a growing need to raise food production, there is also a growing global awareness that water and land resources are finite. Currently some 70% of all water used in the world is for agriculture, but this figure is likely to decrease as demands for industrial and urban uses of water increase (Bos et al, 1993).

The pressure to produce more food with fewer resources requires that performance in terms of both water and land utilization must improve. At the same time

there is widespread dissatisfaction with the performance of irrigation projects. This is true whether performance is measured in terms of achieving planned targets, or in terms of the production potential created by physical works (Samad et al, 1992).

Irrigation efficiencies are low, more water being delivered than actually required. In many irrigation systems, the actual irrigated area is much less than the area commanded. Water deliveries rarely correspond in quantity and timing to crop requirements, resulting in low cropping intensities and low productivity. Maintenance is often poor, and problems of salinity and waterlogging are widespread in arid and semi arid areas (Ibid, 1992).

In conclusion, there is both a need as well as a potential for improving water and land use performance in irrigation systems. A substantial part of the potential for improvement lies in better management.

2.2 Some definitions

Irrigation management is a process by which institutions or individuals set objectives for irrigation systems, establish appropriate conditions and identify, mobilize and use resources so as to attain these objectives while ensuring that all activities are performed without causing adverse effects (IIMI, 1992).

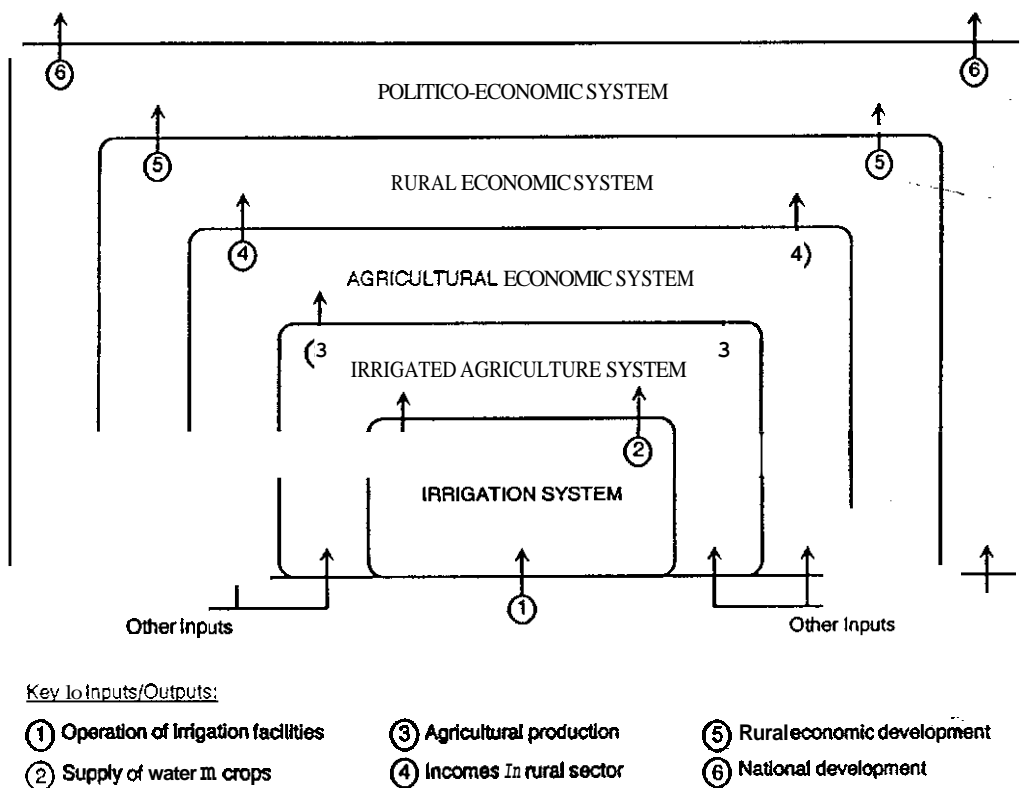
A first requirement for effective management of irrigation systems is that objectives are clearly defined and subscribed to by a majority of the different parties involved. Defining and achieving consensus on the objectives of an irrigation system in itself is a controversial and difficult matter. Different parties involved have different priorities and different interests. Among the many objectives that irrigation is expected to realize, are for example: increasing agricultural productivity; increasing political stability; decreasing poverty; achieving national food security..... WID or gender advocates may add an additional objective to this list, which is that irrigation needs to contribute to the well-being of women, or even that irrigation has to lead to the empowerment of women.

To stick to the last example, gender and WID professionals take the needs of women and men as a starting point for evaluating the performance of irrigation systems, without being hindered by too much knowledge about the technical and managerial possibilities and constraints of irrigation systems. It is true that there are many examples of irrigation projects that have not

adequately provided for gender roles (often with negative effects on women's well-being and status). However, many of the negative and unintended impacts of irrigation interventions cannot be exclusively attributed to irrigation. Nor can it be expected that gender inefficiencies and inequalities in a society can be removed by better irrigation practices, institutions and policies alone.

Some clarity is thus required in what is meant by irrigation and what irrigation can and is expected to achieve. Small and Svendsen (1990) have made an attempt to provide this clarity by developing a framework which identifies different performance and organizational levels of irrigation systems. They define an irrigation system as a set of physical and social elements employed to acquire, convey and distribute water to fields and disperse it to the root zone of crops. The **output** of this system (water delivered) becomes a major **input** into the next level, the irrigated agricultural system, the outputs of which (crops) are the input into the agricultural economic system (see figure 1).

Figure 1. Inputs and outputs in the context of nested systems



Source: Small and Svendsen, 1990

Parallel to these "levels" of performance one can distinguish organizational levels in an irrigated agricultural system. The irrigation sector consists of policy makers and planners usually located in ministries; the agency usually consists of larger institutions responsible for allocation and maintenance of goods and services in support of the farmer community; and the irrigation system level, i.e. the organization responsible for management of a physical system for allocating and distributing water. Broad objectives are set at the system level which (in principle) are turned into specific targets at regional or district levels; these in turn are the basis for specific targets at system level that presumably reflect objectives at the agency level (Bos et al., 1993).

2.3 The invisibility of gender

Despite the increasing international awareness of the importance of gender, and despite the fair number of studies that document the impacts of irrigation development on women, so far very little significant progress has been made in incorporating gender into irrigation planning and management approaches.

One obvious and reason is the often implicit assumption in irrigation designing, planning and management that there is just one member of every farm household engaged in and responsible for irrigation and irrigated agriculture; "the farmer". This person most often is the male "head" of the household. He is the (only) one who is consulted, addressed and whose needs are accommodated by irrigation agencies. It is simply assumed that he benevolently heads the household, controls the household resources and labor and that he is willing and able to take decisions on behalf of his 'dependent' family members.

Attempts to address women without changing this conception of the farming household' will irrevocably address women as being of only marginal significance to the performance of the irrigation system; as housewives and mothers. Such attempts often take the form of small scale token projects to satisfy donor requirements to pay attention to women.

The technical, engineering tradition in irrigation thinking may present some other obstacles to recognizing and accommodating gender differences. If figure 1 is considered a fairly adequate representation of how the reality of irrigated agriculture is conceived by irrigation professionals; by organizations and people responsible for planning and managing irrigation systems, then a closer look at this figure reveals a number of characteristics inherent to irrigation thinking that inhibit the recognition of women or gender issues:

¹ Gender issues of relevance to the performance of irrigation are not confined to intra-household gender relations. The link between irrigation and female labor opportunities and the fact that the majority of employees in irrigation organizations are male are two examples illustrating that gender norms and relations affect the performance of irrigation in various other ways.

1. In this conception of an irrigation system, farmers or water users are seen **as** mere **instruments** in achieving the objectives derived from the technical characteristics of the irrigation system. While it is often known and understood what farmers should do to make the system work, it is seldom understood why farmers and water users do not behave accordingly. It is simply assumed that the interests and needs of irrigators are compatible with those of the irrigation system and its managers.

This technical, engineering bias in irrigation management not only prevents recognizing and accommodating the roles of women, but it inhibits properly conceiving the role of farmers **or** users of either gender.

2. In line with the technical conception of the irrigation system, where water is the major variable, water **users** or irrigators are normally considered **as** a group which is only differentiated **as** far **as** their place, role and function in the irrigation system is concerned. "Equity" in the context of an irrigation system typically refers to the spatial distribution of water across the system. Achieving equity thus means that all irrigators receive the same amount of water, often in relation to the amount of land they have to irrigate.

In this conception there is no rationale for acknowledging social or economic differences between users. Irrigation managers supply water, irrespective of the status or wealth of the receivers and irrespective of their gender.

3. Irrigation management approaches often only consider farmers in their roles **as** irrigators, excluding their roles and tasks in other activities. Likewise, an analytical separation is often made between the irrigation system and the agricultural system. The agricultural system is excluded from the analysis of the performance of the irrigation system. There are many arguments against such a narrow conception of an irrigation system, but what matters here is that it implicitly helps to underestimate the **roles** and contributions of women'. Women, generally, are less visibly involved in activities directly related to irrigation. In many societies the processes of acquiring, allocating, distributing and draining water are considered male activities (sometimes irrespective of who actually performs those activities in the field).
4. Irrigation managers often narrowly focus on, and deliver, water to be used on plots within the command area of the irrigation system to irrigate the main crops. In reality water provided by the irrigation system is used for a variety of purposes, including for example homestead gardens, orchards, fish ponds, watering cattle etc. When men are predominantly responsible for irrigating the main crops (because they have access to irrigated plots), women may be much more involved in other activities for which they

2. This approach obviously also tends to misconceive the **roles** of men.

need water.’ Ignoring multiple uses of water may thus implicitly privilege men’s resource needs and again render women’s involvement in irrigation systems invisible.

To conclude, irrigation management approaches have tended to assume users are male recipients of water. A gender perspective on irrigation and its management calls for a recognition of the fact that male and female farm household members together determine the ultimate benefits of irrigation: they “transform” the irrigation water into agricultural products by skillfully coordinating their labor, knowledge and other resources. In many instances, farm household members are also directly (either formally or informally) involved in the allocation and distribution of water; in the operation, maintenance and construction of the irrigation system; and in the organization of and collective decisionmaking regarding these tasks. Hence, the performance of irrigation systems is not just determined by the physical characteristics of the system, but to a large extent also by the people who use the system. Since these people can be expected to have different objectives to use the system, they will also have different expectations with regard to its performance.

3. Gender needs with respect to irrigation

Developing a gender perspective on irrigation management necessarily starts with the question whether women and men have different interests, needs and objectives with irrigation, and whether they have different capacities and powers to defend those interests or meet those needs.

Following the Small and Svendsen (1990) framework, potential differences will be identified for the system’s impacts, its outputs and for the process of irrigation management. This distinction allows to differentiate between direct outcomes of irrigation that fall under the responsibility of irrigation system level organizations, and those effects that are farther removed causally and need to be dealt with at higher organizational levels.

3.1 Gender specific needs with respect to the impacts of irrigation

Impacts refer to the effects of the irrigation system on the wider environment. The direct impact most often attributed to (and aimed for) with irrigation is increased agricultural production. The literature on gender and agriculture provides a long list of examples of how women and men may differentially contribute to, and are differentially affected by, increases in agricultural production. In general, gender needs with respect to the agricultural production impact of irrigation will evolve around:

³. This is not to deny **that** men may use irrigation water for other purposes as well.

1. The allocation of labor, land, water and other resources to the cultivation of irrigated crops; to construction and maintenance activities and to participation in users' organizations.
2. The **use** of the outputs of irrigated agricultural production, e.g. consumption, storage for use, exchange or sale.

The earlier referred to examples of irrigation development in Africa show that women and men may be differentially motivated to invest labor and other resources to irrigated crop production. The widely **known** and cited example of Christine Jones, who studied an irrigation project in Cameroon, shows for instance that women tried **to** minimize their labor contributions to the newly irrigated rice crop controlled by their husbands in favor of their individually controlled sorghum production. The serious **intra-household** conflicts over the income from rice was a significant factor in depressing the amount of labor available to rice production, which in turn negatively affected areas cultivated (Jones, 1983 and 1986).

Conflicts over the use of outputs were also described by Joke Schrijvers in her study of the Mahaweli Irrigation system in Sri Lanka. Women contribute more than half of the required labor to rice production, but it is usually men who sell the harvest and receive the money. It is difficult for women to make legitimate claims to this money, and it often occurred that very little of it was spend on household needs. In addition, traditional rain-fed cultivation of highlands, which used to provide households with an emergency food stock, was no longer possible due to the introduction of the new irrigation system. Schrijvers argues that the chronic undernutrition within the Mahaweli Scheme is one of the detrimental results of this gender biased planning (Schrijvers, 1985).

Other studies document the gender specificity of less visible and more indirect effects and impacts of irrigation development. Women in the hills of Nepal were highly positive about new irrigation facilities, since these considerably reduced the time they needed for fetching water **for** domestic use (Backer, 1992). In India, the unforeseen impact of canal irrigation on the growth of fodder was particularly beneficial for women, since it enabled them to increase their milk and ghee production through which they could earn some individually controlled income (Stanbury, 1981). The opposite effect may occur with groundwater irrigation, which may lower groundwater tables and thus reduce the growth of weeds used for fodder and trees used for fuel. This was documented for Bangladesh, where the consequent shortage of fodder and fuel significantly increased the time poor women had to spend gathering fuel and fodder. It gradually pushed them towards more marginal sources, such **as** leaves and bark of trees, which hastened deterioration of natural resources (White, 1992).

It is impossible to mention all possible gender specific impacts and effects of irrigation. The many direct and indirect linkages between gender and irrigation development are hard to foresee. They will be different in different cultural, institutional and environmental contexts and will vary with the type of irrigation technology used. However, the examples do illustrate that prevailing gender relations structure the direction and nature of irrigation related developments

and therefore the success of irrigation interventions. Gender analysis can thus help irrigation planners and policymakers to realistically set achievable objectives, and to assess potential trade-offs of achieving these objectives.

3.2 Gender specific needs with respect to the outputs of irrigation

Some of the differential interests and needs women and men may have with respect to the impacts of irrigation will be reflected in differential needs with respect to the irrigation system's outputs. Output measures directly assess the nature and quality of irrigation services delivered to farm households, services which will in turn be important in determining production, income and other livelihood indicators.

How do users evaluate the outputs of irrigation systems? First of all they can be expected to be concerned with the amount of water delivered, or the adequacy of water deliveries.⁴

Possible gender differences in judging the adequacy *of* water deliveries may arise because of a gender division in crops, men being responsible for other crops than women. Very often, the main irrigated crop is controlled by the male member of the farming household. Women will often contribute labor to this crop⁵, but very often they also grow crops of their own. Crops cultivated may be used for own consumption, or they may be sold providing women with a source of individual income. When there is an opportunity of doing so, women will make use of irrigation water in growing these crops. They may take water directly from the channels, or sometimes they use drainage water. However, these crops grown by women *are* often not considered the "main" crop, or sometimes it is not even realized that they are grown. As a consequence, the water requirements of these crops are seldom taken into account when devising water delivery schedules. In some cases, the use of irrigation water for growing crops other than the planned one, or for using water on plots outside the designed command area, will even be considered illegal.

Gender differences in irrigation needs with respect to adequacy may also occur **as a** result of a gender division in **tasks**. Water can substitute labor, like for example in the case of pre-season applications to soften soil for land preparation (Svendsen and Small, 1990). Land preparation is often done by men, which means that pre-season applications of water reduce the amount of male labor needed. In paddy cultivation in Asia, women may be expected to do

4. The set of possible measures employed by users to judge the quality of irrigation services discussed here is adapted from Svendsen and Small (1990).

5. This is not always the case. A recent study in a Niger rice irrigation scheme showed that the labor contributions of women to the cultivation of rice were minimal, since the production of rice is considered a male responsibility (Schaap et al, forthcoming).

the bulk of weeding. Unless they work as paid laborers, women are thus likely to be in favor of increasing the ponding depth which reduces weed growth. In Nepal, women reported that the increased availability of irrigation water had considerably reduced the time needed for weeding (Backer, 1992).

A second measure users may use to evaluate the outputs of an irrigation system is equity. Equity refers to the spatial distribution of water across the irrigation system. When water is short, both farm households and managers will have to address the question of how to distribute the available water among plots and farm households. Equity then becomes a measure of fairness of the allocation of shortage (Bos et al, 1993). It is obvious that notions of fairness will depend very much on existing social and economic differences and power hierarchies. It may be considered fair that an influential farm leader receives a relatively larger share of water, for example. **Also**, farm household members may take local differences in soil moisture holding capacity or seepage and percolation rates as valid reasons for differences in water deliveries (Vermillion, 1990).

A first and very obvious gender difference with respect to equity is that, justified by existing gender ideologies, female irrigators receive less water than male irrigators. This gender discrimination in water allocation may be rather indirect, crops grown by women being considered less important or not being considered at all, and therefore receiving less priority when water is allocated.

Female farmers who grow the same crops as men do, and who are thus in principle entitled to receive an equal amount of water, often face difficulties to claim and actually receive the amount of water they are entitled to. When water is scarce, women are often in a much weaker position to obtain water than men. This is why female irrigators in Nepal, though in principle preferring an on-demand rotation system of water deliveries, nevertheless saw a clear advantage in a scheduled rotation system: the guarantee of getting water, without having to go through the hassle of negotiating for it and running the risk of not getting any water at all (Bruins and Heijmans, 1993).

Considerations regarding equity may also be valued differently by women and men because of differences in the nature and importance of social relations to men and women. Extra-household relations and networks may carry a specific significance for especially poorer women on at least two grounds. They tend to be more disadvantaged in relation to other more tangible forms of resources. Furthermore, it may offer women a measure of autonomy from male authority within the household and can help furnish them with powers of persuasion in their dealings with men (Kabeer, 1992). This may be the reason that women are sometimes reported to place a higher value on equitable water distribution than men do. An example from Nepal documents:

in Bhanyang Tar Ko Kulo (canal) the head reach people initially took much interest in the improvement of the head reach section of the canal, but they were not concerned with the improvement of the tail reach because of local politics. There was a critical

section in the canal from which most of the water leaked, requiring improvement if the tail end people were to receive reliable water. Some women from the head reach said to the head reach male farmers that "if you do not further improve the canal, we females will do the job". This embarrassed the male farmers, resulting in further improvement of the canal in the tail end (Pradhan, 1989).

Different appreciations of the timeliness of water deliveries, which relates to the distribution of water across the season relative to some utility-based standard, may again arise because of a division along gender lines between crops. It was, for instance, observed in Niger that water issues were stopped once the male controlled crop was almost ready to be harvested. The vegetables grown by women still needed additional water gifts at that time. Women experienced severe losses as a result (Dadi Massalachi, 1993). Potential gender differences in appreciating timeliness may also be due to male or female labor peaks; the availability of labor being the standard of utility used.

The convenience of patterns for timing of water deliveries may be different for men and women. Female irrigators may have specific wishes with respect to the time they would prefer to irrigate, because they have to plan their various productive and domestic activities alongside each other. Some of those activities have to be done at a more or less fixed time of the day, like preparing the meals. In Nicaragua, there was a marked difference in the time women and men were willing and able to start irrigating their field; women preferred to start later, because of the domestic duties which they had to perform early in the morning (Blaauw, 1992).

Irrigating at night may be particularly difficult for women, because of social norms which prevent women to go out at night. In Pakistan, the few women that were directly involved in irrigation would send a male relative or neighbor when their irrigation turn was at night. If there was no other possibility, they would try to be accompanied by a family member or friend (Basnet, 1992).

With regard to water quality, women are likely to place a higher value than men on having access to irrigation water which is clean enough to be used for domestic purposes. Also, the health hazard presented by the use of irrigation water for domestic purposes may be felt more by women, since they are often responsible for caring for the sick.

3.3 Gender specific needs with respect to the process of irrigation management

If women and men both have interests and needs with respect to irrigation (irrespective of whether these are similar, complementary or conflictual), it is clear that a viable and sustainable irrigation management process should somehow include male as well as female perspectives. The inclusion of users in operating and managing irrigation systems most often occurs through the organization of users in users' groups or associations. In most irrigation cases, women appear to be almost absent in those groups. This is partly because membership of these organizations is often confined to one member of each irrigating household, who is

either the official landholder or the "head" of households. Both criteria far more often apply to men than to women; the only women who can potentially participate in water users' groups are either widows or single mothers with no adult male living in the household.

In a way, the non-involvement of women, or of their needs and interests, in irrigation management has become a self-fulfilling prophecy. Because irrigation is commonly conceived as a male activity, and because women are not conceived as direct stakeholders of irrigation systems, women have become excluded from planned efforts to organize water users. As a consequence, many women have remained outside of formal irrigators' associations and thus lost the possibility of voicing their concerns.

If, how and where women should and can be involved and participate in the organization of and decision making with respect to irrigation will depend on the specific nature of their needs. An example from the Philippines illustrates how several irrigators' associations insisted in having both husbands and wives as members representing the household in the association.

One reason for this was that allowing both wives and husband to become members of the association allowed for more flexibility; either the woman, the man or both would then be able to attend the meetings. Another reason was that, even though agricultural decisionmaking is very much a joint affair of both husband and wife, women and men have distinct domains of influence. As most women control the cash-flow within the household, it was found that associations encountered problems when collecting irrigation fees, unless the women were involved in formulating policies regarding irrigation and membership fees collection schedules. Community organizers also learned that unless women were encouraged to participate, financial obligations of farming households could not be guaranteed (Iilo, 1988).

While the nature of women's needs may make their participation in irrigation management desirable, the inclusion of women's perspectives will often not be just a matter of allowing women to become members of users' organizations. The experiences of female irrigators, who are officially entitled to join users' groups, illustrate that women often find it difficult to bring their opinions and needs forward. Women in Nepal were reluctant to attend water users' meetings, because they were sure that nobody would listen to them (Bruins and Heijmans, 1993). In Sri Lanka, female farmers often prefer to send a male relative to meetings rather than going themselves. They may also ask a male friend or neighbor to represent their interests; send a letter to the irrigation officials; or try to meet with one of the office-bearers of the water users' organization.

Attending meetings and discussing matters in public may be thought of as typical 'male' activities, associated with political gatherings which are often traditionally confined to men. Sometimes, women are not expected to speak in front of men or in public. Women may simply lack the confidence and the experience to deal with irrigation matters in public, since all interactions with outside institutions mostly take place with men, and since men often receive the bigger part of information and training.

It may also be that participation in meetings is simply not judged to be efficient and rewarding. In Peru, women stated that it was of little use going to meetings, since the most important decisions were not taken in those meetings but during informal get-togethers of men (Pol, van de, 1992). Experiences of female irrigators in a Mexican ejido document the difficulties they faced when trying to secure enough water for their sugar cane cultivation. The **only** possibility (which was not very effective) for women to claim their water rights is through the official way, by going to the offices of the local department of the Ministry of Irrigation. Men secure their access to water either by bribing the water guards, or by maintaining good relationships with them by offering them drinks and food, and by inviting them to 'mariscos' (seafood restaurants with the reputation of being brothels). A woman would lose her reputation if she were to follow the same course of action (Brunt, 1992).

In *summary*, while the differential needs and interests of women and men with respect to irrigation may call for the inclusion of both of their perspectives in planning and decisionmaking, women and men will often have different perceptions on the costs and benefits involved in participating in users' groups. The attractiveness of participation may be less for women, partly because the costs and time spend for travelling or attending meetings may be relatively higher for them, but also because social norms and values are not always supportive of women engaging in public meetings.

The inclusion of women's perspectives, their ideas, opinions, needs and interests will thus require an active and conscious effort. Women in Nepal said that they would first need to learn how to read and write, before feeling confident enough to participate in meetings. They also suggested that they should maybe get together as women, and try to organize among themselves first (Bruins and Heijmans, 1993). In an Indonesian irrigation scheme, women were first organized separately. Special training sessions were organized, both for women themselves as well as for field agents and other officials. Special female staff were also appointed and trained. This made women gain confidence and helped them to overcome some of their initial reluctance to attend 'male' meetings (van Dok et al, 1992).

4. Opportunities for increasing gender sensitiveness

It is no exaggeration to say that women are a truly forgotten group in irrigation thinking and practice. This gender blindness is partly self-sustaining; since specific women's needs and interests with respect to irrigation have never been accommodated, irrigation has come to be defined and conceived as a man's world. Women's needs and interests, irrespective of their nature, will often be automatically perceived as being of only marginal significance to achieving the 'mainstream' objectives.

WID advocates and NGOs working for and with women have since long criticized irrigation planners and irrigation institutions for their gender biased approaches by showing how these negatively affect women. Donors have been active in supporting and requesting more and better attention to gender and women while planning and implementing irrigation projects. So

far, these actions have generated very little real change. Instead of using new insights derived from gender analysis studies to improve existing planning, design and management approaches, women have been merely added on to the agenda of irrigation agencies as a separate item.

The little success achieved so far in making irrigation planning and management more gender sensitive can be partly attributed to wrong expectations about the capacity of existing irrigation management institutions to respond to new demands. Too much emphasis so far has been given to what is desirable (empowerment of women) and too little to what is possible. Irrigation management institutions whose main task is to make sure that the right amount of water is delivered at the right time and in the right place cannot only not be expected to be interested in empowerment of women, but they also often do not have a real capacity to change gender inequities. What is within their reach and mandate is the satisfaction of specific needs women may have with respect to irrigation, although even this may sometimes be conditional upon changes in other sectors.

Successful recommendations to better and more recognize and accommodate gender needs and interests within irrigation contexts should be formulated in such a way that they contribute to, or at least are compatible with the objectives of the responsible institutions. The linkages between gender issues identified at tertiary unit level and more general objectives of irrigation management should thus be clarified.

Unfortunately there is not always a direct positive correlation between greater gender awareness and a better performance of irrigated agriculture. Sustaining gender biases may in some cases even be functional for achieving some of the irrigation system's objectives. However, in most cases gender inequities will have trade-offs in terms of other objectives, such as health, environmental sustainability; the productivity of other crops; etc.

It may be that the opportunities for addressing issues that are closely related to irrigation, but which as yet remain unaddressed, will increase. The shortcomings of mono-disciplinary technical approaches to irrigated agriculture have become increasingly clear. The widespread dissatisfaction with the low performance of irrigation systems, the growing environmental awareness, and the trend in developing countries to privatize the management of irrigation systems all call for a critical reassessment of existing irrigation management concepts, practices and institutions.

This reassessment seems to offer more room for integrating gender. The trade-offs of implicit gender discrimination in terms of environment and health will become more easily recognizable and visible. The inclusion of upstream watershed management in the responsibilities of irrigation institutions will give scope for recognizing the links between water used for irrigated agricultural production and the availability of and need for water for other uses. And a focus on more users' participation in operating and managing irrigation infrastructures creates the possibility of discussing and analyzing if and where women can and should be involved.

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