

Developing the skills and participation of women irrigators

Experiences from smallholder irrigation in Sub-Saharan Africa

Felicity Chancellor

(TDR Project R 6062)

**Report OD 135
July 1997**



HR Wallingford

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Department For
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Summary

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Good quality, irrigation-specific and irrigation related training and advice are scarce in smallholder irrigation schemes in Sub-Saharan Africa. In the past, little attention has been given to correct identification of the end-users and sensitivity to their needs has been lacking.

Women as major participants in irrigated agriculture have suffered as a result. The effectiveness of smallholder irrigation in using water efficiently and in generating income is severely limited by women irrigator's lack of empowerment. Shortcomings and successes of the past are discussed and recommendations made for improved training programme solutions.

Gender-sensitive approaches to training are expected to require explicit attention to funding, gender awareness of irrigation institutions, women's special needs in respect of content, location and timing. It is also recommended that irrigation developers look beyond the strict confines of irrigation-specific training to help relieve the stress of heavy workloads and family responsibilities on women irrigators. Women's participation in determining and prioritising their training requirements will be crucial to the success of future programmes.

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1. INTRODUCTION

Irrigated agriculture accounts for two-thirds of the water withdrawn from the earth's rivers, lakes, and aquifers and produces approximately 40% of total food production (FAO, 1996). Demand for water to satisfy the needs of industry and populations are increasing. On a global scale, agriculture will be obliged to give up water for higher-value uses in cities and industries. Water to satisfy these demands can be found by irrigated agriculture becoming more efficient. The challenge is to sustain irrigated food production with less water.

In Africa, difficult climatic conditions, a general lack of suitable crop varieties and sufficient fertiliser inputs, labour scarcity, insecure land and water rights, all militate against large-scale developments. Much of the irrigation development is small-scale, therefore, and involves smallholder families who typically irrigate plots ranging in size from 0.1 ha to 5.0 ha. Water-use efficiency in smallholder irrigation schemes is in the range 30% to 60%, leaving substantial room for improvement (Chancellor & Hide, 1996). As irrigation development is crucial to ensuring food security in both the short and long terms, and small-scale irrigated production will have to supply an increased amount of food with less water in the future.

Another feature of African irrigation is that women are major contributors to the irrigation workforce. They also bear a heavy responsibility for fetching and carrying water for their families. Water scarcity problems fall particularly on them. To achieve improvements in water-use efficiency in Africa will require women to become more efficient water users. A complex interaction of physical, economic and social issues to improve the skills and participation of women needs to be addressed if smallholder production is to ensure sustainable improvements and water savings.

1.1 Small-scale irrigation development

Small-scale development is common to Africa, yet despite the recognised importance of socio-economic issues in village level developments, technical considerations such as water quality and distribution methods remain the focus of debate in irrigation development. Insufficient attention is paid to the economic, social and workload implications for small farms and the individuals and groups who run them (Chancellor & Hide, 1996). This arises partly because irrigation agencies are set up to accommodate "top-down" technical innovation, partly because rural communities are not confident about determining their technology needs and partly because the interface between developers and communities is often limited and largely consists of influential male farmers. Thus, for practitioners attempting to use participatory approaches in irrigation development, there is no familiar mechanism or structure to follow. At the same time, "top-down" development is no longer acceptable either to people or to major donors. Stakeholder participation in irrigation development and rehabilitation is recognised as the appropriate strategy for correctly identifying beneficiaries and contributors and provides a tool for helping to achieve "bottom-up", demand-led development.

Currently, although participation is espoused, practical implementation issues are not yet fully addressed. This results in erratic outcomes. In some cases, outcomes are improved significantly and projects benefit from the close involvement of stakeholders and a sense of ownership among participants. In others, some participants are unable to voice their preferences adequately and so results are disappointing or unsustainable. Failure to include all key stakeholders in the participatory process has detrimental effects on the outcome of projects and where this occurs, poor results inhibit involvement in future projects (Dey, 1981, 1990; Carney 1988). Often the neglected stakeholders are women.

1.2 Why attention to gender issues is necessary

Women tend to be invisible actors in irrigation, partly because they commonly do not own land, partly because they are identified with low-technology or traditional subsistence farming and partly because of gender-biased social structures and support services, including irrigation agencies themselves. However, women are crucial to successful smallholder irrigation because they contribute most of the labour

requirements. Innovation or change to empower women to perform irrigation better will therefore have a strong impact on irrigation performance. Few irrigation departments keep separate records relating to men and women irrigators and, therefore, are blind to differences in conditions or performance.

Opinions about the role of women in irrigation are often based on results of small, intensive sociological studies. While the quality of such studies is good, there are inherent dangers in expanding the experiences of isolated studies to policy level decision making. On the other hand, understanding of the roles of men and women stakeholders is essential to interpretation of statistical information (Zwarteveen, 1994). Participatory development techniques are often adopted in an attempt to resolve these difficulties but women are relatively inactive in the participation process. Social, cultural, institutional and physical constraints all contribute to women's apparent reluctance to participate (Olson, 1995; Silva-Barbeau, 1996).

Women are major contributors to household and national food security, particularly in irrigated areas. Yet their contribution in this sector often goes unrecognised and is not rewarded. This further reduces their lack of bargaining power, their ability to participate or gain access to resources, and training which might enable them to improve their contribution.

During the "Women in Development" decade (1975-1985) attention focused on directing development projects to women beneficiaries. As a result, "Women's projects" were promoted. Subsequent evaluation reveals mixed results. Although there were some successes, projects commonly marginalise women from mainstream economic development, either by selection of inappropriate technology or by increasing women's workload. The attitude that women can be provided for in a minimalist way whilst the real business of development remains in male control is common among governments and donors. Other projects were found to be unsustainable; in many cases because they were socially unacceptable. Unfortunately, many projects were not evaluated and the long-term impact on women remains unrecorded.

Recently, the importance of women to the success of sustained irrigated production has received wide recognition. In Africa particularly, women provide labour for irrigated production on a day-to-day basis especially in female-lead households which now account for some 25% to 35% of smallholder irrigators (Chancellor, 1997). Thus many women are entirely responsible for the household irrigated production and many more consistently increase the range and intensity of their activities as their men spend longer periods working away from home. In most rural irrigating households, women have a key role in production. It is imperative for all these women and their families that they are able to improve food production and sustainable agriculture through effective irrigation.

Rural women still lag behind men in attainment of literacy and numeracy. Women come from low skill levels so that investment in the education and training of women can have a significant impact on irrigation performance and irrigated production. The case for targeting women in training programmes is further supported by the findings of the World Bank who claim that investment in the education of females had the highest rate of return of any possible type of investment in developing nations (FAO, 1996).

The 1992 UN Conference on Environment and Development (UNCED) declaration "Agenda 21" calls on countries, funding agencies and institutions, to redress the imbalance, which now exists between men and women, in control and access to resources and rewards for work. Agencies such as Unifem and Instraw are dedicated to the principle of equality of opportunity and reward. This international commitment to equal opportunities has policy implications that cannot be ignored. The International Food Policy Research Institute (IFPRI) and World Food Programme (WFP) emphasised, during the World Food Summit in Rome, November 1996, the positive and far reaching social benefit of money in women's hands. Women spend family incomes on health, nutrition and education.

1.3 Why women's training is an issue in smallholder irrigation

Smallholder irrigation relies on the skills of women to provide the major labour input in virtually all of the African smallholder irrigation schemes. On some schemes, women provide all the labour required and there are few schemes where women provide less than 60% of the total requirement (Chancellor, 1996)

In irrigation systems and projects, even where more than three-quarters of the end-users are women, it is common to find that opportunities for women to improve their own situation, or to implement production improvements to the benefit of their families, are scarce. Very little training has been delivered to date. Clearly, if future food-demand is to be met, women need opportunities to improve their agricultural water use, to produce more food and to generate more income

The present role of women is poorly understood and the role of training tailored to women's needs is largely unknown. Constraints to women's participation in training and adoption of new techniques must be identified and opportunities for change discussed.

2. CURRENT SITUATION OF WOMEN'S TRAINING IN SMALLHOLDER IRRIGATION SCHEMES

Reviews of development literature and data from HR Wallingford's Women in Irrigation study (Chancellor, 1996) strongly suggest that women irrigators want training and advice. Women feel that training has a positive influence on irrigated production and their management capacity. Women are highly motivated to succeed in economic terms because of their commitment to family care. In these circumstances, women are expected to benefit substantially from increased access to advice and training. However, this will only come about if constraints to their participation are identified and removed.

2.1 Women's needs

Women face particular constraints to defining their training needs:

- cultural preferences for assigning tasks to genders
- arduous and time consuming cultivation provision and tasks
- home and family responsibilities
- cultural complexities in allocating produce and incomes from specific types of land

These constraints show that the development of appropriate content, location and timing of any training is critical if success is to be achieved. Women may need assistance in defining their training needs through a participatory process in which detailed information is provided for them about the format and content of proposed training sessions. Provision must be made for women to suggest changes and to plan for necessary training.

Project managers also face constraints when seeking to:

- ensure their own gender-awareness
- employ women and provide them with an appropriate work environment
- implementing gender-sensitive approaches

If agencies and projects are serious in working towards implementing gender-sensitive approaches, achievable short-term targets for gender training for existing staff and employing women should be set.

Cultural and social preferences and constraints

The fact that separate meetings are needed to allow women to speak freely indicates the strength of cultural and social constraints. In the field, there are, in most places, clearly defined roles for women in irrigated production processes. The gender allocation of work or crops, is determined by established gender roles such as women's role on food provision and men's role in animal traction. Increased commercial activity in smallholder farming is leading to change and affords opportunities for women to increase income generation from irrigated agriculture. The argument for increased efficiency of water use as a result of female involvement may do much to encourage men to support policies to offer training to women. In general, men do not oppose training for women and accepted women extension staff without problem. Although men commonly claim to consider women and make decisions for the good of women, they appear blind to the possibility that women may view development differently to men. Techniques to encourage farmers to investigate strengths and weaknesses of sub-groups of irrigators in their schemes would improve the gender-awareness of both men and women farmers. Involving men and women in identifying training needs has the potential to increase participation in training and to enhance the adoption rates of new techniques.

Women regard personal capacity building as important. A lack of control over their productive agricultural resource makes it difficult for women to control benefits and they are challenged to improve their situation. In marriages, although women's difficulties are as important as in households where men are absent, the challenges are different. Both groups suffer heavy workloads but additionally married women are subject to the view of their husbands, although they also derive physical and financial support from the men. Female "heads of household" gain experience in making decisions but loose in terms of physical and financial support.

The lack of female participation at higher levels of irrigation policy formulation contributes to the neglect of women's views, lack of emphasis on the positive aspects of female participation and inattention to gender aspects of irrigation design and rehabilitation. This aspect is accepted by male professionals as the perceived natural outcome of women's failure to take an interest in technology. The strategic disadvantage created through lack of women at a policy level limits the benefit derived from women's participation in "women's meetings" at the community level.

Workload and time constraints

Women in all three of the countries studied contributed large amounts of labour for irrigation in addition to their work in the homesteads and communities. Their working days were long and hard and the potential for taking on additional duties is very limited (Appendices 1,2,&3). Despite this, the training offered is mainly focussed on production and very little addresses the problem of workload reduction. Time constraints are part of women's heavy workload in all the schemes but time takes on a particular importance if the irrigated fields are at a distance from the dwellings and infants and children must either be left or taken along to the field. The scheduling of irrigation can be a source of difficulty if women are responsible for water control in distant fields.

Allocation of benefits and control of resources

Allocation of benefits from irrigation varies between communities and households. There was no indication that benefit was linked to input of labour and in most places the main determinant of reward was ownership of either land or traction. Women tended to be poor on both counts. In The Gambia, women were offered training to operate and maintain traction but it was too early to judge the extent to which their control over the use of machinery improved.

Women's lack of control of inputs was seen in Kenya as a major constraint to production and therefore to income generation and scheme sustainability (Appendix 2). Credit and extension strategies to promote women's use of fertiliser and pesticides are successful in increasing yields and in increasing women's income where women have rights to use land for their own profit. However, in many cases women reported that the final decisions on allocation were made by men although women's views were sometimes considered.

Ensuring gender-awareness and implementing gender-sensitive approaches

The term “gender-awareness” was poorly understood in all three case studies. Communities did not demand gender-sensitive approaches from agencies or NGOs. In addition, gender-awareness training is not necessarily available or in demand with the result that funds were not allocated. There is a widely held assumption that participation will ensure gender balance, however, the evidence of women’s inability to participate effectively in public meetings suggests that the opposite may be true.

Rural women are disadvantaged educationally yet training material is often dependent on users having some literacy skills. It does not appear to be generally recognised that women are further disadvantaged by inattention to appropriate training materials.

The presence of women among project staff and at beneficiary meetings is often taken as sufficient evidence of gender-aware development despite evidence that women fail to participate in mixed meetings. “Women only” meetings in the early stages of project identification provide women with an opportunity to discuss their objectives, doubts and needs. Analysis and monitoring of the impact of irrigation development on women is seldom undertaken as a matter of course. Women’s participation in irrigation development is not generally monitored nor is baseline information available. Gender-disaggregated performance or management data from irrigation schemes is not normally available. Long-term goals of men and women are not understood and so potential impacts of change or design on sustainability of smallholder irrigation cannot be well predicted. The effect of policy and training initiatives are not recorded on a gender basis. Gender issues are often addressed in special studies funded from outside the developing country and access to the reports may be limited. The result is that irrigation institutions tend to be blind to gender issues.

The additional cost and time required to implement gender-sensitive approaches may be considerable although again little information on cost is available. It is not clear who will be responsible for the extra cost nor is it clear if the cost can be justified.

Employment of women

Women’s lack of formal technical qualification and their difficulties in fulfilling the hours of the standard working day militate against their employment in the irrigation sector. Women are employed in extension services and are accepted and valued in that role. Women are not given training to deal specifically with the needs of women farmers and it is likely that there is pressure on them to be seen to prioritise the needs of men farmers in order to ensure their acceptability.

Rural women are significantly less literate than rural men reducing their potential for paid employment other than wage labour. However, they are skilled in organisation in the community and no formal recognition of these skills is instituted. Indigenous knowledge of plants and food sources also remains unrecorded. Employers remain ignorant of women’s skills because of the informal way they are acquired in the family and community. Women are experts in managing water shortage in domestic and gardening settings and their expertise goes largely unnoticed.

2.2 Training

In total, the amount of training which has been received by women on irrigation schemes appears to be scant. Training offered by irrigation departments, agricultural departments and developers focuses on technical skills; women did not generally participate. A wider range of training is available for farmers, and for women farmers in particular, through NGOs and women’s organisations. Training tends to be production orientated although it is clear that labour reduction has a high priority for most women (Appendices 1,2 & 3).

Irrigation agencies and departments presently fail to involve women farmers in determining their training needs. However, the demand-led element of training is encouraged and enabled in Kenya where Provincial Irrigation Units and provincial offices of the Smallholder Irrigation Support and Development

Organisation (SISDO) co-operate in involving women. The range of beneficial training extends far beyond the technical training envisaged at the outset of the study.

In Lamin in The Gambia there is evidence to support the view that combined credit provision, extension, application methods and business development clearly boosted production and women's incomes (appendix 1). A training programme required the community to select a woman for training rather than the training agency. This ensured a level of community support and commitment by helping the woman succeed in undertaking the course offered. The merits of this approach cannot yet be measured and although the approach does not conform to participatory, notions it has the advantage of ensuring some community agreement and support.

Women's demand for training

Women's demand for training has often been assumed to be low because they did not take up training offers. However, because women are already constrained by their heavy workload and time constraints imposed by their roles as cooks and mothers, time for training cannot always be found. Women themselves appreciate that they could benefit from technical training in the operation and management of irrigation systems. Given the current heavy involvement of women in small-scale, smallholder irrigation and the trend for increased numbers of women headed households, it appears that investment in training is essential.

Practical implementation

Training provision has not always produced the desired or expected outcomes, not necessarily because the training content is poor or inappropriate, although this doubtless occurs, but due to constraints which either preclude attendance or deter adoption of the innovative technique. The main constraints were:

- women's priorities
- women's time schedules
- women's workload
- community priorities

Women welcome training, to address their real needs. New techniques promoted in response to felt needs are assimilated and used to effect. Evidence to support this was identified in Gambia in relation to power tillers and to scheduling water in gardens, and in Kenya in relation to horticultural credit and zero-grazing units.

Monitoring results

Technical training identified by the study lacked good indicators of success. Repayment rates are a convenient indicator by which to monitor effects of training associated with credit schemes. Increased farm income is commonly used to justify training outcomes but, as it is influenced by so many other parameters, it is a weak indicator. Further development of techniques to monitor participation in decision-making should be initiated

Issues for future programmes

The contribution of women to irrigated production is not appreciated. In many cases, women's independence and opportunity to control private income has decreased because of the addition of irrigation to their workload. Women will not be motivated to increase or improve the quality of their contribution unless they can reduce their workload; this lack of motivation in the workforce poses a threat to sustainable irrigated agriculture. Developers who care about the long-term success of their projects will be concerned to address this key constraint.

Despite disadvantages in literacy skills, some women have a sound irrigation knowledge. However, women feel constrained by their lack of literacy, general knowledge and management experience, and by their workload from devoting time either to committee activities or to training. Thus in mixed groups of

irrigators, men are allowed to take more decisions than women.

Women recognise that inappropriate irrigation design and equipment contribute to the heavy workload of women in irrigated agriculture. They also recognise that, where women are dependent on men to assist them, there is potential for a conflict of interests.

3. RECOMMENDATIONS

Women and their training needs appear to have suffered from inattention in the past. Attention to their training needs must now address the effects of past failures. There has been a general failure to appreciate the roles of men and women in smallholder irrigation. Thus lack of understanding of the differing needs of men and women irrigators has been a major cause of neglect and failure.

3.1 Establishing the importance of providing training for women irrigators

The need to train end users to get the best from equipment is widely accepted. In irrigation there has been little attention to training as a basic need of all irrigators; women and men have both had less than optimal access to training. There are a number of reasons that contribute to women having even less access than men and there are now a number of reasons why women need more training than men.

Women desperately need better irrigation training because:

- Rural women have low living standards
- Rural women have heavy workloads
- Many rural women have heavy family responsibilities
- Women are crucial to the success of smallholder irrigation
- The success of smallholder irrigation is crucial to food security in rural communities

3.2 Relating women's objectives, production objectives and sustainable development to training programmes

It has been established that women have particularly heavy workloads on small-scale irrigation schemes throughout Africa. It is clear that pressures arising from a predicted rise in population and urbanisation will create a greater food demand that must be partly satisfied by irrigated production. This is likely to draw more women into irrigated agriculture and increase the emphasis on high levels of production thereby further increasing their workload. In many cases, women are already constrained by their workload and their priority is workload reduction. There are several implications for training programmes:

- Women must clearly prioritise their objectives. The provision of training for women should target their priority issues
- Training programme objectives should be understood by, and gain approval from, the whole community. Women will not continue with any training activity unless, they are supported by the community
- Training should contain a balance of labour-saving and production-oriented techniques based on established priorities
- Developers must recognise that irrigation constraints can be addressed through training in other sectors. It may be necessary for the irrigation developer to form links with other agencies such as credit institutions, livestock departments and entrepreneurs.

3.3 Establishing women's priorities

Women in this study identified a need to improve their knowledge of system operation and management. However, training programmes must be tailored to meet women's needs and a method of establishing these needs must be developed so that local difficulties in involving women can be overcome. A meaningful

participation is essential and may require a number of preconditions to ensure success. The findings of the study suggest that:

- Women may need help to conceptualise their priorities
- Women need secure forums for discussion of issues which are gender-contentious
- Women must have adequate motivation to participate
- Relevant institutions must be able to act on women's priorities

For these conditions to be met, women must participate at the earliest stages of a project and well before decisions and budgets are finalised. Participatory techniques tend to require long lead-in times and, where women are participants, this is especially likely for a number of reasons. Rural women may need extra time allocated to them because (a) they lack experience in participation, (b) they lack education, (c) are short of time and (d) may not be convinced of benefits due to poor past experience.

3.4 Promoting support for training

Training must not take women away from existing work schedules and obligations, otherwise the community will regard training as counter-productive. Community approval is essential to ensure support for women during training. Approval is more likely to be forthcoming if training is demonstrated to be of wide benefit to the community. People need to know about the potential benefits for the community of having particular groups of people trained for particular jobs. They need information about the effects of training elsewhere and, if possible, a first-hand account of benefits, responsibilities and costs to the trainees and their families. Visits to other places can be helpful.

3.5 Balancing training content

A balance must be maintained to serve the twin objectives of improving irrigation performance in terms of production and reducing women's workload. Innovations to reduce workload may be acceptable without production increases. Ways of achieving balanced training should be explored in a participatory manner so that women can select appropriate training for their group, scheme or village needs. It may be necessary for the agency to link with other community services to provide the required balance.

3.6 Linking with other sectors

Well planned, demand-led training programmes will build the capacity of institutions, raise irrigation efficiency and generate improved income for farmers. However, depending on the local government set-up this can pose problems associated with department budgets and staff allocation. Co-operation for holistic approaches to irrigation training may effect training programmes in other sectors. Care should be taken to ensure positive effects where possible. This can involve commitment of staff out of normal hours and away from their normal working environment. It is important to pay attention to motivating staff to accommodate changes. De-motivated trainers will adversely affect the quality of training delivered.

In poor communities, training of non-irrigators in income generating activities such as maintenance services to irrigators, food processing or other value adding activities, may also address priority needs of irrigators such as workload relief. The cost aspects must be debated.

3.7 Relating training to everyday irrigation practice, policy and planning

Training women in accordance with their perceived needs will not benefit them nor improve irrigation performance unless there are opportunities to exercise their skills. Irrigation agencies, farmer committees and NGOs should plan ahead to provide trainees with opportunities to practise new skills. It is important in doing this to consider the stakeholders involved in such changes and to involve them in deciding re-allocation of duties. Particularly where women are entering work areas normally exclusive to men, the implication that trained and skilled women pose a threat to men should be avoided.

Improving gender-awareness in the community may have to precede provision of training for women

farmers. Awareness-raising itself is a two way process in which issues are highlighted for the community and local conditions are appreciated by the irrigation developers. Practical needs must be carefully debated and considered and should include:

- Timing and locating training in a way that enables women to participate with minimum disruption to their work schedule
- Providing support to trainees such as transport and crèche facilities
- Motivating trainers appropriately
- Providing opportunities for practical application of new skills immediately
- Involving farmers and irrigation staff who will interact with the trainees on completion of the course
- Incorporating monitoring of training through attendance and achievement records and monitoring training impacts on women's participation in water scheduling, irrigation performance and distribution of benefit.

3.8 Developing demand led training programmes

In the past women have been neglected in irrigation training programmes in part because of the cultural attitudes in their own communities and in part due to the attitude of development agencies, funders and technocrats. Although, a change of attitude is already evident among rural developers and in Government policies, women themselves are inexperienced at identifying their needs. This is particularly true in rural areas where women lack the basic literacy skills so often used to access or request information. In addition, the change of attitude to women's participation is not always shared by rural men who may feel threatened by a change in the power balance. It is therefore important to develop techniques for enabling all women to participate in formulating demand for training. Experience suggests that attempting to solve the literacy problem at project level before addressing specific training needs is ineffective.

Demand for training does not arise spontaneously. People need information to be aware of existing opportunities. Awareness raising on the general principles of participation, on water-resource use and on the range of possibilities open to irrigators should precede identification of training needs. Wide ranging discussion of the cost implications, allocation of tasks and distribution of benefit should also precede participation in identifying training needs. It is important that demand should be "informed demand" otherwise unrealistic demands will arise. However, training offered in the absence of demand will not attract commitment, and is unlikely to be reinforced by use, or to achieve positive results for either men or women.

Awareness raising should not be directed only to women. Gender awareness is important for both men and women and will improve understanding of the way in which work and benefit are allocated. Effective techniques for awareness raising are through discussions, visual aids, mobile displays, agricultural shows, videos, visits to different locations and exchanges of ideas with farmers there or through drama workshops.

Developing demand led training is not, therefore, a simple matter of waiting for farmers, women farmers or groups to make spontaneous suggestions. A process has to be in place to allow and encourage irrigators or potential irrigators to review existing performance and to consider options for improvement before they make specific demands for training. Long term planning is required but, to achieve long-term goals, short-term targets should be set and reviewed at regular intervals.

3.9 Commitment to training

Training must be an ongoing process to accommodate the constant change in market demand, production conditions, conflicting labour demand and changes in technology. Participation of stakeholders in developing this process will be a key factor in ensuring success. There must also be a commitment to training as part of irrigation development. Women are key stakeholders not only because of the high proportion of work undertaken by them in irrigated farming but because a continued increase in their workload poses a threat to sustainable irrigated production.

It is therefore recommended that:

Women must be involved in planning training from the

women and representatives of women's groups are included in the identification of key participants in laying the foundations for demand led training programmes. It may be necessary to enable them to do so by funding awareness raising activities.

Publicity and debate will improve the end product and must precede training initiatives

awareness campaigns should precede training initiatives and the objectives of the training programme made clear. New opportunities arising from the training should be highlighted and potential worries for the community must be fully addressed so that people are reassured or their concerns are used to adjust the programme.

Progress will depend on cost effective results and must be monitored

training programmes should include a monitoring element so that trainers, trainees and the community can assess effectiveness and make informed decisions for future training in the ongoing process. Publication of effective training should be directed to communities and produced in easily assimilated forms such as posters and stickers.

SMART targets must be set to encourage achievement

targets should be set that are Specific, Measurable, Achievable, Realistic and Timely for trainees, trainers and communities. The setting of targets should be an activity in which all stakeholders participate. Training targets should be carefully checked for relevance to the need identified at the outset of the process. If they become irrelevant, they should be changed or updated in order to produce flexible, demand-led, gender-sensitive programmes.

Training needs identified by rural women are likely to be essentially practical at the outset. Poor women will be concerned to increase production and incomes and to conserve energy. However, it is important that any training programme addresses the strategic needs of women irrigators, at least by alerting women to strategic disadvantages.

Irrigators should be encouraged to see training as a regular activity to increase their contribution to irrigation development and planning as well as improving irrigation performance. An interactive workshop approach encourages the two way exchanges needed for that approach to become a reality. Workshop activities have a role to play in assisting professional staff to learn from rural irrigators and to relay farmer priorities to planners.

Commitment to training must be embodied in the institutional arrangements so that both men and women farmers have a sense of belonging to a process of constant improvement. In a user oriented approach, motivation must be considered at all stages. Irrigators should not regard training as a one-off event,

externally provided, but as a part of the regular activity of their irrigation scheme. The logical extension of this approach would be that a stage is reached when women demand employment in the irrigation sector and secure representation of women's interests in planning and policy formulation.

Women will not improve performance if they are not rewarded

Rewards for women may be either a reduction in workload, personal skill development or an increase in income, or better still all three. Men need to understand that, by accommodating the need of women to improve their conditions, irrigation will become more effective, economically viable and sustainable. When that happens, the whole community benefits. On the contrary, without motivated women, returns from irrigated agriculture may remain static or even decrease.

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Appendices

“Women in Irrigation” case studies from small-scale smallholder irrigation schemes in Sub-Saharan Africa

Appendix 1

Summary of findings from The Gambian case study

Appendix 1 Summary of findings from The Gambian case study

The Women in Irrigation study was carried out by HR Wallingford for the Department for International Development (DFID). The data collection took place in Gambia, Kenya and South Africa where twelve separate smallholder irrigation schemes were investigated.

Methodology

The study set out to investigate the role of women in irrigation in Sub-Saharan Africa, on selected smallholder irrigation schemes in Gambia, Kenya and South Africa. The objectives were to:

- develop tools to identify gender roles in smallholder irrigation,
- identify links between design, O&M and the gender assignment of tasks, and
- develop guidelines for gender-sensitive training and capacity building to improve sustainable food production.

The work was carried out in three phases. The first phase consisted of a literature review and establishment of links with irrigation agency planners and developers in collaborating countries. This was followed by a data collection phase in which HR Wallingford and country partners sought the views of smallholder irrigators. The analysis of the data was followed by an interactive phase in which ratification, expansion or amendment of the findings was sought from farmers and from agency personnel.

Literature review

Material directly relating to gender issues in irrigation was limited and generally indicated the lack of existing gender-disaggregated data available. Review of related literature at the outset of the study provided background material on gender-issues already identified in smallholder agriculture and applicable to irrigated situations. The review identified considerable gaps in knowledge about who makes decisions and how those people become involved. There was a notable lack of information relating directly to women's training programmes or to their evaluation. Books, articles and documents reviewed were listed and detailed, some with abstracts in a working document (OD/TN 80)*.

The most important issues arising from the literature review were:

- the increase in women's workload caused by irrigation development
- women's lack of literacy, and
- women's poor access to extension, credit and technical training

Together with experiences shared by collaborating groups this information was used as a basis for formulation of the case studies. The development policies of the host countries and the implications of clauses referring to gender in Agenda 21 (Rio 1992) were taken into account. It was expected primarily to generate information to provide baseline data about women's involvement in smallholder irrigation, identify the potential for training and assess training approaches.

Case studies

A sample of schemes was identified as typical of smallholder irrigation development in three Sub-Saharan countries. Each of the three countries is characterised by different cultural and political settings for irrigation functions. Gender-issues are heavily influenced by these conditions so it was necessary to consider performance and gender roles within their country setting. Training is considered in the broadest sense and different approaches are evaluated.

Lack of baseline information and monitoring constrained evaluation of training in all three countries. Nonetheless, it is possible to comment on women's changing role in irrigation. Overall, the study indicates

* OD/TN 80 is available from HR Wallingford

positive influence of training on irrigation performance but highlights the need for further work relating the outcome of training to key issues of performance and sustainability of schemes.

Brief questionnaire surveys including evaluation of existing data, individual structured interviews, key informant interviews and group discussions, sought to establish, at each site, typical perceived needs and constraints for men and women relating to participation in irrigated crop production and water-management. The related demand for training was assessed. The main focus of these case studies was to establish who controls decisions relating to irrigation activities on the small holdings, who decides the day-to-day operation and maintenance of the schemes and who contributes to the short-term strategies and long-term plans for irrigation activities.

In order to set the information gathered in context, physical characteristics and performance data were obtained where possible. These background studies and initial analysis of the socio-economic/attitudinal survey data are presented in country reports (OD/TN 82)*. Background information for the Kenyan schemes was provided from an earlier HR Wallingford research project and in Gambia, existing performance data were obtained for the rice sites. In South Africa background data were provided by the Institute of Agricultural Engineering.

Questionnaires and structured interviews were developed with assistance from Dr A Hoecht of University of Portsmouth and advice from AERD, Reading University. The questionnaires were field tested in Kenya at Kibirigwi using experienced enumerators from the Central Bureau of Statistics, GOK. The format was used in the other Kenyan case studies and in The Gambia. The questionnaire was rendered more user-friendly in South Africa where amendment and expansion of the technique was undertaken jointly by a group comprising members from the Institute of Agricultural Engineering, the Directorate of Agricultural Economics in Pretoria and HR Wallingford (OD/TN 82).

The main focus of questioning was to establish:

- women's labour contribution to irrigation
- women's control over farming decisions
- women's role in managing water and deciding policy
- women's contact with extension and training
- women's perceived constraints to improved sustainable irrigation development
- women's perceived needs for participation, decision making and training

Follow-up discussions

The format for structured group interviews was developed in Kenya during discussions with women's credit groups at Kibirigwi (OD/TN 82, Appendix 3.1). The format was used successfully in other Kenyan schemes and in Gambia. Free-ranging discussion was encouraged where appropriate. The objective was to discuss aspects of training and to relate them to the perceived needs and constraints identified in the surveys, developing ideas where possible and soliciting views and suggestions where possible. The structured interviews followed analysis of survey material in order to use findings as a basis for discussion. It was felt that this would both ratify findings and allow further discussion of issues. In practice, discussions took place only in Gambia and Kenya.

A feature of the last phase was the difficulty encountered in setting up group discussions in which women took part. The most successful format was discussion with groups consisting of women only, although the presence of a male interviewer on the study side was acceptable and did not apparently inhibit women from expressing their views. Women representatives of credit groups were willing participants and had experience in analysing the different situations faced by people of different gender.

* OD/TN 82 is available from HR Wallingford

In Gambia, particularly, men claimed to be able to speak for the women. The women were too busy in the field to take part in discussion whilst the men were able to find a whole morning to devote to the study. Interestingly, during group discussions in Gambia, where both men and women were present, men asked that their views be given equal weight with women's comments, clearly regarding the focus on women as threatening. The group discussion in which equal participation was most apparent was where participation was already the main focus of the project.

Summary of findings in The Gambia case studies

Women's role in irrigation, control of resources and labour contribution is substantially different in The Gambian rice growing schemes and vegetable gardens. The scale of operation, social and cultural rules and economic conditions appear to favour women in horticulture in terms of participation in decision-making and control over the benefits of their labour.

Women's role

Gambian rice irrigation has developed from traditional swamp-rice cultivation. Traditionally rice growing was, almost exclusively undertaken by women while men cultivated dryland areas. During colonial times the dryland areas became a major groundnut production area. Improvement projects and new developments involved men in irrigated production systems and as a result restricted female control of swamp land, particularly land that was developed to produce two crops in a year. Existing agricultural work patterns were not fully considered in developing the irrigation systems and women were not initially consulted (Dey, 1981). Restructuring of irrigated rice projects to improve gender-sensitivity was later undertaken and accompanied by investment in provision of child-care facilities, road access to swamps and adult literacy programmes.

The study reveals that decisions relating to irrigated crop production are taken by both genders and that overall Gambian women participate. In households where married partners are both resident, men and women decide the crops to be cultivated on the plots for which they are responsible. However, more men than women decide on inputs purchased and labourers hired, although women often decide the deployment of household labour and join in marketing decisions. In female-headed households women enjoy greater decision-making but face difficulty in commanding sufficient resources.

Tasks are assumed to be gender-based, and men and women undertake some jobs and not others. This assumption was only partially supported by the findings which suggest that women contribute heavily to all tasks except animal husbandry and farm maintenance. The exact pattern of work varies a little according to the location of the scheme. Men are generally thought to be responsible for land preparation and harvest and women for planting weeding harvesting and processing. However, the sample revealed women contributing heavily to land preparation. Men's contribution to maintenance and animal husbandry was clearly dominant in most locations.

Women still do not control benefits in proportion to the work they contribute, especially when they work on "maruo" fields, which are designated to produce for family needs. "Kamanyango" fields benefit women directly and it is from these fields that they can sell to male household-heads. Women also contribute voluntarily from their private fields to the household and many women thereby reduce their own command of resources. They are keen to contribute to family supplies, especially when family income from cash crops is low and families are under pressure to make ends meet.

At present, although women are still major contributors, they cannot generally be said to control rice production. Despite efforts to favour women in rice projects, Gambian women have lost control of rice production over time and clearly feel inadequately compensated for this change.

Horticulture offers women opportunities to generate income from small areas of land, especially in the urban and peri-urban areas. The gardens investigated by the study fell into two categories, one where extension and technical assistance were intense and the other where extension in both services was weak. Information on performance of the gardens could not be obtained in the time frame available but it was

clear from observation that the quality and quantity produced in the gardens where support was available for the women cultivators was superior to the other gardens.

On horticultural schemes, women dominate all decision-making and do all agricultural and water related tasks. Occasionally, where this is not the case, crop and input decisions are taken by a son. Women mainly acquire plots in vegetable gardens by inheritance or gift from mothers and aunts. Some women have only one or two plots, each plot is approximately 20 square metres, other women cultivate up to twenty plots. Women with more plots appeared to perform better which may indicate that a minimum number of plots is needed to significantly boost production to a higher level.

Women gardeners are usually also seasonal rice growers and have difficulty meeting labour requirements for gardens going during the rice season. However, it is relatively unusual for women to take on labourers and some plots are under-utilised. Marketing is undertaken individually at local markets which is time consuming, costly and inefficient.

Water management

Generally, interviewees want to be involved in managing irrigation. They recognise that to do this, the function of irrigation committees must improve. Women feel that their role in cultivation will be more effective if they are closely involved in the allocation of water and recognise that adequate water control is needed to achieve a good match between farm needs and water delivery.

In rice fields, women perceive control of water as a task of major difficulty and display little confidence in their own ability to address problems which occur. Rice-project staff were seen by the women as appropriate people to take the necessary action to allocate water, but it was clear that the participation by women in deciding any course of action by project staff was minimal.

A problem arises in relation to land preparation. Timing is crucial to the whole crop calendar and if adjacent fields are on different schedules water control is a huge problem. Women need support services to overcome this and felt that some sort of variable service charge should be agreed between farmers and project staff offering land preparation services

In small horticultural schemes, women control the allocation of water between themselves, although there were technical problems with which women had difficulty. For instance, at Bakau women had a water salinity problem. Correct advice on use of the wells may have helped them avoid or ameliorate it. However, salt water has intruded into their wells, and because of lack of knowledge they were unable to consider solutions by management or investment in new technology. The salt-contaminated wells had fallen out of use, but women were able to allocate water from the undamaged wells by consulting with one another and formulating rules and priorities. However, the total volume of water available is reduced and women who have plots adjacent to disused wells carry water much further than formerly. The fact that irrigation continued testifies to the women's ability to organise and share the limited supply.

In contrast, where technical support was available, women were able to sustain irrigation at a more profitable level and maintain reliable incomes. Improved water management was not the only contributing factor to good performance but was a key factor combined with other support mechanisms.

Impact on women

Women claim that they work much harder than previously as a result of the introduction of vegetable gardens and improved rice schemes. However, they continue to irrigate in difficult conditions. A number of factors combine to motivate them:

- Women are obliged to provide for families and, in recent years, women's contribution to the family requirements has increased relative to that of the men.
- Women are keen to raise funds to educate their children

- Other sources of income are limited especially in the rural areas.

Training needs

Women emphasise interest in improving their knowledge of irrigation water management. Women show keen interest in learning to operate pumps and power tillers. Most farmers feel competent to manage their own farms when the required water is available on time. Three main themes emerged:

- increasing personal skills and capacity building at group level
- reducing workloads
- improving production

Less mentioned directly, but nonetheless important, were:

- control of water
- equity of water available for crops, and
- reliability of water delivery.

Existing training

Projects selected for study, demonstrated a variety of different approaches to training men and women. All the rice schemes had significant problems of one sort or another. The three rice schemes had different approaches to training and to women's role. The approaches are broadly described as:

- alleviation of constraints
- technology transfer
- participation

The **alleviation of constraints approach** attempted to influence land tenure through plot allocation, to improve literacy through provision of adult literacy programmes and to lighten women's workload by provision of facilities such as crèches, swamp access roads and health facilities. The scheme had a high labour contribution from women. The impacts of a literacy programme on performance cannot be evaluated although there is undoubtedly an impact on the lives of the women concerned. This is partly due to lack of gender-based data and partly because links between water-management decisions and production achievements are unclear. Decline in yields from 7t/hectare to around 4 t/hectare and decline in irrigated area indicates generally poor performance.

Technology transfer initiatives provided specific technical courses to enable both men and women to develop individual skills in machine operation and maintenance. Women were explicitly targeted in this approach and communities were involved in selecting the women to participate in the training programmes. Training for operation and maintenance of power tillers was provided for 56 people, equal numbers of men and women. Women trainees were enthusiastic about training and looked forward to using their new skills. Sadly, village elders clearly disapproved of women handling power tillers and commented that they did not want women coming home tired. The women regarded this as a poor excuse as they find power tillers, in general, less tiring than hand-preparation.

Evaluation of the training has not yet taken place. Women are now able to operate and maintain power tillers and reduce the risk of delay and costs, however, women's total workload may also increase. It is not clear if the overall effect will be beneficial for women. Yield achieved on project sites averaged 6.2 t/hectare but the project did not achieve targets set for area developed.

Participatory approaches were designed to encourage both men and women in the community to participate in planning and construction of irrigation systems in partnership with project technical and community development staff. This approach involved commitment and investment by the communities involved on a significant scale.

Participation was recognised to require more time than was envisaged at the outset so that the programme achieved only a fraction of the development targets set. Technical difficulties beset the development and it was unclear if these difficulties arose as a result of the approach used by the project. Emphasis on participation of beneficiaries possibly detracted from the technical content. Agricultural advice was integral to the programme and yields achieved averaged an impressive 7.5 tons per hectare although on a limited area. Discussions revealed that farmers had major doubts about their ability to sustain water control as the project stood.

In gardens, extension advice, training in water management, application techniques, marketing and business advice appeared to have a positive effect on profitability. Marketing as a group reduced transaction costs and assisted women in handling demand based planning. Interaction between women farmers and extension specialists encouraged an innovative approach to discovering new markets and exploring possibilities in a systematic way. Women who are unassisted and market their produce alone maintain a conservative and often high-cost approach to marketing.

Discussion

Women have a strong tradition of rice cultivation and good field-skills both in rice and horticultural growing. This skill-base requires reinforcement by adding new skills relevant to operating modern water-control systems. The government of Gambia is making a conscious effort to include gender-awareness in projects to enable women to strengthen their roles. Training addresses women's needs in some aspects.

New and improved training programmes could be based on established groups. Presently, increased female involvement in individual commercial growing has reduced commitment to communal work groups (Barrett 1995) However, there is potential for building on existing groups; Village Saving Associations (VISCAS), which have become increasingly popular, to improve access to inputs to improve women's control of productive resources. Principle elements from the model could be used in conjunction with earlier strategies to promote rice growing skills between women of different age groups in Mandinka villages (Weil, 1973).

Negative situations, arising from projects and policies which oppose strongly held cultural beliefs, can be avoided. Stakeholder analysis can be used in conjunction with interactive participation to identify strengths and weaknesses of groups, and potential threats and opportunities presented by new policies. An analytic effort of this type might encourage men and women to look at the positive aspects of working together.

Effective participation of women is hard to achieve in the short term. The Women in Development section in the Ministry of Agriculture confirmed that a number of options had been used in projects, many of which had failed to establish meaningful participation for women because of the blurred distinction between the terms participation and information gathering. Failures occur when participation stops short of involvement in and responsibility for decisions. Participation is then only information gathering and decisions based on second-hand information tend to be weak. Our survey suggests that female participation is very uneven but, in general, it fails to put women at the centre of decision making in irrigation development and management despite the crucial contribution of women's labour to success. Cultural, technical and educational issues all contribute to the current situation in which women have difficulty in voicing their needs and ensuring that their views are considered, even at the lowest irrigation policy making levels.

Participatory approaches have helped involve women at village level despite being hampered by technical difficulties in the projects undertaken. It was noticeable that women's participation in discussion in the Small-scale Water Control project villages was voluntary, lively and well informed in comparison to that at the other rice schemes. They were well able to discuss why the project was not performing well.

Future training issues

Women need and want training and advice. There are indications that production and women's capacity to improve their situation are positively influenced by training. Women are highly motivated to succeed. In these circumstances women could be expected to benefit substantially from increased access to advice and training. However, this will only come about if constraints to their participation are identified and ameliorated.

Women face particular problems in defining their training needs:

- cultural preferences for assigning tasks to genders (eg women are expected to weed because this is unskilled and training is not needed, but women might benefit from learning about strategies to reduce the need for weeding)
- already heavy workloads lead to constraints in time afforded for training
- severe time constraints make location of training important
- cultural complexities in allocating produce from specific types of land (eg women may produce different crops on different categories of land, training for one may not apply to the other and will be regarded by them as useless if the profit from the particular crop is controlled by men)

Women may need assistance in defining their training needs through a participatory process in which detailed information is provided for them about the format and content of training sessions. Provision must be made for women to suggest changes and to plan for necessary training.

Project management also face constraints in:

- ensuring their own gender-awareness
- employing women and providing them with an appropriate work environment
- implementing gender-sensitive approaches

In order to work towards implementing gender-sensitive approaches, achievable short term targets for gender-training for existing staff and for employing women should be set.

Appendix 2

Summary of findings from the Kenya case study

Appendix 2 Summary of findings from the Kenya case study

Cultivation in Kenya has always relied heavily on female labour and irrigated agriculture is no exception. Women play a key role because of the intense labour-use in irrigation. Smallholder irrigation has a long history in Kenya. Schemes established in the colonial period are still in operation under farmer management. Indigenous irrigation, practised for centuries, continues and new farmer-initiated private and group developments contribute significantly to Kenyan agriculture. It is clear, from reviewing literature on Kenyan systems, that women play a major part in producing crops but not in farm management or irrigation system decision-making.

Three group-based smallholder schemes were identified for investigation. One typified smallholder irrigation in remote locations where subsistence crops and commercially sold crops were both important to the farmers, another was representative of schemes where the main focus was commercial production and the third was typical of rice schemes surrounding Lake Victoria. Socio-economic background information was available for all three schemes.

Women's role

An assessment of gender responsibilities was made for irrigation, dryland and domestic tasks. It estimated that women in Kenya work, on average, one and a half times as long as men each day. Men contribute virtually nothing to the broad domestic group of tasks. Overall, women are responsible for domestic work, child bearing, infant care and more than half the agricultural work. Men contribute heavily to land preparation and are slightly more involved in animal husbandry than women but contribute less than half the total of agricultural work.

There is a tendency for women to exert more control over subsistence crops and less over commercial crops. This has the effect of keeping female income low and of reducing women's incentive to improve vegetable production. Growth of commercial vegetable cultivation for export markets has changed farmers' interest in irrigation. Men are willing to work in the fields, attracted by high financial returns. Women want to be active in decision-making and to ensure they receive their share of the benefits.

In practice women find they are obliged to work but unable to determine their conditions and rewards. However, in recent irrigation developments in Kenya, it is recognised that women have a key role in ensuring sustainability. The Irrigation and Drainage Branch of the Ministry of Agriculture through its Provincial Irrigation Units (PIU) encourages participation of farmers at all stages. Gender awareness is emphasised and processes to encourage female involvement in decision making are incorporated in the development cycle. Current practice explicitly requires women to attend meetings and take part in decision-making. To this end, in the preparatory phase of projects:

- A meeting can only proceed if 70% of beneficiaries attended and if 50% of attendance are women.
- a "women only " meeting forms part of the preparatory process
- matters arising at the "women's meeting" are discussed to reach consensus on women's representation

Although such measures improve female attendance at meetings, it is early to claim effective participation. Low participation in irrigation related decision-making was common in the survey, despite the efforts of the irrigation and extension staff. The impact of "women only" meetings on benefit allocation is difficult to determine. Women claim to gain confidence from sharing their experiences to argue for fairer shares within the household.

Decision-making

Despite the large female contribution to work, female participation in decision-making remains low both on the farms and in the irrigation system. There is a high degree of commercialism on smallholder irrigation schemes and a tendency for men to dominate commercial decisions. There was a weak but positive correlation between the proportion of irrigated crops sold and decision-making by men.

Generally, participation of women in decision-making lags behind their participation in all aspects of irrigation work. It is important to remember that total equality would be a situation in which women and men each contribute 50% of the total work required and that men and women participated in all, that is 100%, of the decisions relating to irrigation. Results show the Kenyan horticultural schemes indicated that whilst women contribute 52% of all work, i.e. a little more than their share, they participated in only 42% of the decisions, less than half of their share. Women contribute nearer to 80% of work growing subsistence crops and participate in the same proportion of decisions.

Existing training

Training specifically targeted to women in the irrigation sector is limited. On most smallholder schemes extension is available only through the national extension network which cannot always provide specialist irrigation advice. Women reported less contact with the extension service than men, although it appears to be satisfactory when women are contacted. It would seem that the service is generally geared to approaching male farmers in preference to females. Women's access to training suffers as a result of infrequent contact.

Where irrigation extension is available, women's groups were important in the process of targeting women with extension messages and, on one scheme, incorporated "women only" project initiatives. This was supported by technical advice and credit facilities. The main problem is in ensuring that women have sufficient access to extension. Our figures suggest that although women have less access to government extension services, they have access to advice through women's groups in addition.

Credit organisations are also a source of training and advice. They recognise women's need for control of resources and offer a number of alternatives. On one scheme, credit is distributed in kind providing seed, fertiliser and advice through women's groups. Women repay after the harvest. However, marketing difficulties were such that women found it difficult to attain sufficient financial security to operate without credit. Their main difficulty was access to water to mature the crop at a time when the market price was good. Without representation on the farmer committee they could not easily present their case for reallocation of water. So, although there was no explicit discrimination against women, there was no forum in which a strategy could be developed to allow both men and women to maximise their profit from irrigation. Nonetheless, women were enabled to irrigate profitably which they could not achieve without credit.

A zero-grazing milk production project feeding cows on irrigated fodder, to enable women to generate income was a popular innovation. The training element was geared to animal husbandry and milk production and marketing with a direct link to management of irrigated land. Although a zero-grazing programme may not be universally appropriate, the following points merit attention.

- convenient timing was crucial to success
- explicit training for women was provided
- training reduced additional female work load where possible
- women were encouraged to make decisions
- opportunity was provided for women to exploit new skills.

One scheme investigated was initially developed as a direct result of women acting together to acquire irrigable land. Women were initially active on the management committee but according to the key informant were discouraged by the lack of attention paid to their views. Women are glad that men have now taken over the management of the scheme. It was noticed that women contributed less to irrigated work on this scheme and also took a greater part in expenditure decisions. They did not see a need for greater involvement in water management on the irrigation scheme but showed enthusiasm for a rain water harvesting project which had successfully provided domestic water and reduced their labour. A Posho-mill project was also praised for reducing their labour requirement.

In all three systems, involvement of women in water control was minimal. Scheme design in the past favoured systems in which manual control of flows within the delivery system was minimised. Therefore there was no training for either men or women in relation to this work. Men on the farmer committees did acquire any skills that were needed for operation. However, determining the time schedules for sharing water is an activity for farmer action in which women take part. A Kenyan scheme investigated in the socio-economic survey had a successful schedule in which women played a key organisational role. Women's full time presence on the scheme enabled them to regulate and reorganise as required to produce a flexible water-sharing schedule.

In Kenyan smallholder irrigation, most cultivation is hand done, therefore training in use of equipment is not a priority issue. In general, modern equipment, such as sprayers, is used by men and as far as could be gathered they learned correct usage through sales promotions and instruction leaflets. Training on safe use of equipment is needed for both men and women.

Opportunity for careers in irrigation development and policy formulation for women are few at present. The proportion of female students entering public universities in 1995 was 26.4% (Economic Survey 1996) the estimate for the proportion of women in agricultural engineering is 5%. Agricultural extension has a high proportion of women entrants but there is little opportunity to specialise in irrigation. A new initiative, scheduled to run for the next five years at Jomo Kenyatta University of Agriculture and Technology, entitled "Country Training of Women Group members on Sustainable Agriculture for Women Farmers", offers a new approach. It includes irrigation in the curriculum. This type of course will certainly fill a need.

In mainstream irrigation, not in "women's projects", institutional arrangements do not include meaningful participation of women in water management. Women generally remain outside the debate on irrigation policies thus reducing the potential for future development to meet women's needs. Women need explicit support to participate in water management decisions.

Discussion

Labour saving aspects of training, advice or projects are clearly important to Kenyan women in a situation where intensive irrigation work demands much of their time. Although most of the work is done by women, most of the extension training and advice is oriented to increased production rather than labour saving. This may influence women's apparent lack of contact with extension services.

The link between women's participation in water management committees and improvement in women's conditions is perceived as weak. This is not surprising if women are consistently a minority in representative bodies. In addition, cultural norms, educational disadvantage and lack of experience in mixed debate make women's participation in committees ineffective when a gender-based conflict arises.

Women's commitment to labour-saving projects is evident, although the examples found did not directly reduce labour need for irrigation, the water harvesting and posho-mill project were well supported by irrigators.

Future training issues

Women's participation in irrigation management is not monitored nor is baseline information available. Women's motivation to participate in irrigation management needs to be investigated in order to establish long-term goals and potential impact on sustainability

Women regard personal capacity building as important. A participatory approach working with women is required to identify training opportunities in extension, vocational training or professional opportunities. "Women only" meetings in the early stages of project identification provide women with some voice in projects.

The need for separate meetings indicates strong cultural and social constraints. Men might be encouraged

to relax control if increased water-use efficiency results from women's involvement in and training for water management. Encouraging farmers to investigate strengths and weaknesses of groups in schemes will improve gender-awareness of both men and women farmers. New approaches to training needs have the potential to increase women's participation and adoption of new techniques.

The lack of women at higher levels of policy formulation contributes to neglect of women's views, lack of emphasis on positive aspects of women's participation and inattention to gender aspects of irrigation design and rehabilitation. The resulting strategic disadvantage limits the benefits from "women's meetings" at a community level. Targets should be set for action to develop strategic support for women, such as providing women's liaison officers at district or provincial level.

Training should not be restricted to purely irrigation issues. Marketing and market research, setting up credit organisations, supplying domestic water and many other labour reducing activities may be essential prerequisites to specific irrigation training. Irrigators should participate in identifying and prioritising training needs.

Appendix 3

Summary of the findings from the South African case study

Appendix 3 Summary of the findings from the South African case study

Smallholder irrigation development is likely to fulfil a key role in developing rural areas. The development process itself will contribute to capacity-building in the water and agricultural sectors as well as increasing food production and economic activity. Essentially a community development, irrigation involves technical, managerial, institutional and social ability. As in many other African countries, cultivation relies heavily on the labour of women. Involvement of those women will be a crucial element in future development. Former smallholder irrigation development generally lacked participation of end users in design and policy planning, however, the need to include communities and promote gender considerations is now a key consideration.

Two of the schemes investigated were heavily geared towards women and the remaining two appeared to have developed without a conscious gender policy. On the women oriented schemes the managing agencies played a major role in organisation. In the other schemes, women's participation in farming was reported to be surprisingly low. Overall, in the sample of irrigators interviewed, over one third were considered to be "de facto" female led households, indicating the importance of addressing women's needs in promoting successful irrigation.

Women's role

Women play a major part in production although their contribution is variable, being influenced not only by the social and cultural conditions but also by the institutional arrangements surrounding the development. In most rural households, cooking, domestic work and gathering fuelwood are exclusive to women and animal husbandry is exclusive to men. On the irrigated fields, water application tends to be mainly done by women whereas scheme maintenance is done by men, although in some places the men employees of the agency are responsible for maintenance.

Agricultural tasks are allocated on a gender-basis but actual task assigning varies between places. However, in the many female-headed households, all the agricultural, irrigation and domestic work is done by women. In male-headed households, only land preparation, maintenance and animal husbandry were consistently done by men. Women therefore are the main contributors of labour. Some key irrigation tasks are shared, especially those requiring intensive labour input, such as planting, harvesting and marketing. Farmers employ labourers on a permanent basis in a few cases but, it is more common to hire labour by the season, particularly for harvest, for which labour is often paid in kind. Women and youngsters are often involved in this seasonal labour force as they are cheap to hire.

Decision-making

On women's schemes, women are clearly involved with the implementing agency or project staff in deciding operational and policy decisions. However, because they generally lack control over productive resources such as inputs and equipment their ability to carry through plans is restricted. On women's schemes, women typically participate in water sharing, fee collection and, group decisions on crops and marketing.

In schemes not specifically targeted to women, their role in this type of activity was very limited.

Employees of managing agencies tend to be male and they undertake much of the water management. Men make most of the farmer decisions in water management and major decisions on crops and inputs. Generally, women expressed the view that more participation by women would improve the quality of decisions. Although women did not wish to exclude men from decision making, they wanted to share in the process. Their assessment of "best practice" scenarios, indicates that women are confident in their ability to manage water effectively.

Men, generally regard themselves as major decision makers and major contributors to both agricultural and water management tasks. They clearly have reservations about the advantages to be gained from deciding

water management strategies in mixed gender groups. On the other hand, women generally regarded themselves as major contributors of work, with a substantial right to a role in decision-making. However, women show relatively more tolerance and see advantages to shared decision-making. Overall, women lacked education and less than a quarter could be considered literate. Educational disadvantage is likely to be a major constraint to women in asserting themselves in decision-making in mixed groups.

Impact of Irrigation

The most positive impact in all places was the increase in food available for children. Women are particularly sensitive to food needs and emphasised this aspect more than men. However, generation of cash is important at all the irrigation schemes and both men and women are anxious to sell profitably in the markets. Although irrigation was not the sole source of income, for most families, irrigation provided almost 90% of the total cash available.

Men recognised that women work long hours in irrigation and other duties but emphasise this aspect less than women. Equally they accorded less importance to the fact that women, because they work longer hours, are deprived of opportunities to earn money for their own private use. Some women clearly feel the work they put into irrigation does not bring corresponding benefit. Even at "women's" schemes, men control expenditure decisions for the money generated through irrigation.

Existing training

Extension training is available on all the schemes investigated. In two women's schemes, extension was clearly targeted to women and, in addition, they received training in use of irrigation equipment. There were, however, difficulties associated with equipment and women complained of physical problems encountered in moving irrigation equipment around their fields. Extension is production oriented and the approach was generally top-down rather than interactive. Training impact was not monitored in a way that clearly linked the effects to irrigation management as the concept of farmer management was limited in the schemes investigated. Women's schemes clearly improved women's access to information and training, and it was evident that women responded positively in terms of individual skill development and confidence in participating in dialogues and in committees. There was some doubt as to how effective they were in influencing agency decisions. Although it was not possible to correlate women's training with improved production the general impression was that training and participation had positive effects.

Irrigation knowledge

In general, there is a need for more extension and most respondents feel they can improve performance. A rough assessment suggests that less than a quarter of them possess a sound knowledge of irrigation. Around half display just adequate knowledge (including those with sound knowledge) and half appear to require assistance to make better use of irrigation water. Overall, there was no significant difference in the numbers of men and women who achieved sound knowledge ratings. However, on two schemes, no women achieved the sound knowledge rating. It is possible that poor performance resulted from male dominated farming and over-direction by the agency.

Farmers lack information about their irrigation delivery systems and have a weak basis for comparison of different irrigation techniques and innovations. Over 80% of interviewees would like to increase their technical understanding of how their irrigation scheme delivers water. They were also interested in options for controlling the water in different ways. In general, technical knowledge is seen as an enabling and capacity-building opportunity by both men and women. Irrigators are confident in their knowledge of field application (although it appears that they are not fully justified in this) and make understanding the water distribution system a priority.

Discussion

Women are major contributors of labour in irrigated production. While their contribution is appreciated it is recognised that they have given up some independence and opportunity to control private income. Women are not necessarily motivated to enlarge or improve the quality of their contribution.

Women are keen to influence irrigation and offer good insight into using influence in committee activities to improve irrigation performance. Despite disadvantage in literacy skills some women have sound irrigation knowledge. In fact, there was no correlation between women who had been in school and women who knew about correct irrigation. However, women feel constrained by their lack of literacy, general knowledge and management experience, thus, in mixed groups of irrigators, men are allowed to take more decisions than women.

Women expressed a keen interest in improving their participation in water management and farmer committee activities through training. This was the case in all systems. Apart from the problems of illiteracy and lack of confidence, women are constrained by their workloads from devoting time either to committee activities or to training.

Women recognise that inappropriate irrigation design and equipment contribute to the heavy workload of women in irrigated agriculture. They also recognise that, where women are dependent on men to assist them, there is potential for a conflict of interests

Future training issues

Responsiveness to user needs

Future training programmes will benefit from demand-led and gender-sensitive approaches. In order to achieve this, effective participatory methods must be selected which actively encourage women to prioritise their needs regarding training in the irrigation sector.

It appears that labour saving is high in the women's priority list both in terms of making jobs physically easier and in terms of reducing the total workload, especially the time taken in irrigation related tasks. It will therefore be important to select the least labour intensive strategies for improving production. There may be instances in which it is appropriate to consider improving quality rather than quantity to command high prices and simultaneously reduce the demand for labour.

Holistic approach

Emphasis must shift from purely production-oriented programmes to ones which include labour-saving and capacity-building elements. In recognition of the complex and commercial nature of sustainable irrigation women must be aware of links between irrigation, marketing and conservation so that parallel or overlapping training programmes can be considered.

Innovative training material

Although women are constrained by lack of education generally there is no evidence to suggest that irrigation related training is dependent on literacy for success. Demonstration and media training techniques should be investigated for low-cost and rapid-application possibilities.

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