



**COMMUNITY PARTICIPATION IN TRADITIONAL IRRIGATION SCHEME
REHABILITATION PROJECTS IN TANZANIA:
REPORT OF A COLLABORATIVE RESEARCH PROJECT**

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ABBREVIATIONS

EEC	European Economic Commission
KZIU	Kilimanjaro Zonal Irrigation Unit
NGO	Non-governmental organization
SNV	The Dutch development aid agency
TANAPA	Tanzania National Parks
TIP	Traditional Irrigation Improvement Programme
UNDP	United Nations Development Programme
UKUKI	The first irrigators' cooperative in Kikavu Chini
UWAKICHI	The current irrigators' cooperative in Kikavu Chini
WUA	Water Users' Association

EXECUTIVE SUMMARY

The Irrigation Section of Tanzania's Ministry of Agriculture is increasingly adopting participatory methods in projects to rehabilitate traditional irrigation schemes. This report presents the results of a collaborative research project involving Irrigation Section staff, the Economic and Social Research Foundation of Dar es Salaam, and villagers in three research sites: Kikavu Chini village in Kilimanjaro Region and Mtandika and Msosa villages in Iringa Region. The research aimed at learning how government and NGOs can better support community participation in the rehabilitation projects and in the formation of irrigators' organizations.

The rehabilitation of Kikavu Chini's irrigation scheme used relatively conventional methods that did not involve villagers in planning or decision-making, whereas the rehabilitation projects in Mtandika and Msosa villages in Iringa Rural District included a variety of participatory approaches.

Research Methods

The methods used for this research project provided an opportunity for community groups to analyze the issues they found most important with respect to the rehabilitation of their schemes. During the first phase of the research, 12-15 small group meetings were held in Kikavu Chini and Mtandika over the course of a month. Men and women landowners, tenants, and laborers were invited to separate meetings, as were members of the village council, irrigators' organization, and water distributors. Villagers discussed their expectations prior to the rehabilitation and their participation in its planning and implementation. They also discussed the formation and operation of their new irrigators' organization. Most importantly, villagers conducted their own analysis of how the problems and the positive aspects of these processes affect the current operation of their rehabilitated schemes and are likely to affect its future sustainability.

During the second phase of the research 20-25 villagers in each village helped develop a sample survey aimed at confirming the findings of the first phase. They themselves administered the questionnaire to 80 randomly chosen farmers on their schemes. The research concluded with a two-day workshop in which villagers and government/NGO staff discussed the results of this collaborative research process. This report attempts to bring these results to the attention of policy makers and all others interested in participatory methods of project development.

Research results

The research found compelling evidence that the participation of many different groups (men, women, owners, tenants) in the planning and implementation of rehabilitation projects and in the formation of irrigators' organizations enhances the technical, social,

economic and environmental sustainability of irrigation schemes. It also found that the costs and benefits of rehabilitation are very unevenly distributed among farmers, but village-led efforts to increase equity, especially by giving landless groups more secure access to land, can significantly increase participation in the rehabilitation and the operation of schemes, which in turns improves the prospects for their sustainability.

The second section of the report describes the rehabilitation processes and the formation of irrigators' organizations in each research site from the perspective of the villagers and the district and zonal irrigation unit staff who took part.

Kikavu Chini

Kikavu Chini's extensive rehabilitation was implemented by the Irrigation Section's Kilimanjaro Zonal Irrigation Unit. It involved considerable new construction, including a new weir and a 3 kilometer long new main canal. The project ran out of funds very early on leaving it with two serious technical problems: a major breach of the traditional main canal where 50 percent of the water in the scheme is lost, and a major gully problem that causes periodic damage to the new main canal.

Villagers were not involved in the planning of the rehabilitation at Kikavu Chini, and they were not informed about the technical choices made due to the insufficiency of funds to complete the project as designed. This led to resentment, a failure to contribute much free labor to the project, and to serious difficulties in operating and maintaining the rehabilitated scheme.

Kikavu Chini's irrigation organization, *Uwakichi*, was formed as a cooperative. It has opened a shop to supply inputs, rented office space, and hired a full time manager. These expensive functions, which are only tangentially related to the main functions of an irrigators' organization, seem to be undermining *Uwakichi*'s financial sustainability.

Mtandika

Mtandika's rehabilitation was the result of a flood disaster that washed away the scheme's weir. Villagers sought assistance from the Dutch-funded Traditional Irrigation Improvement Programme (TIP) that was working in the nearby village of Msosa. TIP helped the villagers create a new weir, build a gully crossing structure and a much-needed sand trap, and to improve the main canal and primary division box. The sand trap door was soon damaged, but has not been repaired for two years because the WUA's funds had to be used to pay the for the scheme's water right and to register the water users association. WUA leaders' inability to convince farmers to pay additional fees reflects their inadequate skills in financial management and information sharing.

Villagers and district staff participated far more in the planning and implementation of the rehabilitation in Mtandika than in Kikavu Chini. Planning meetings were combined with leadership training seminars during the early stages of the project. TIP used contracts that were worked out with villagers and district staff to specify the contributions

and responsibilities of all agencies involved in the rehabilitation, including TIP. When villagers initially failed to provide the labor required for construction, TIP stopped the work and sued for breach of contract. At this point women became heavily involved in resolving this crisis.

In order to increase the participation of women in the project, TIP had assisted the local agricultural extension agent in developing a gender training programme that encouraged men and women to analyze gender differences in access to resources and participation in decision-making. This training plus TIP's requirement that women take part in both planning and implementation of the rehabilitation project succeeded in breaking down strong traditional barriers to women's participation in public life. As a result, women were well represented in the WUA formed during the project. They also took leadership roles in the rehabilitation process itself.

The formation of an independent water users association was facilitated by TIP training seminars organized for both the village council and its water committee. Local government staff also took part in both training and planning meetings, giving them the experience and skills needed to provide follow-up assistance when villagers request it.

Msosa

The research conducted in Msosa village was focused on the process of distributing irrigated plots to 500 villagers and on the impact of the land distribution on participation in the rehabilitation project. TIP promoted land distribution because land ownership in Msosa had been highly concentrated before the rehabilitation and because the rehabilitation would make it possible to irrigate an additional 80 acres of land.

The village council planned and implemented the land distribution. Women's plots were grouped together in the area that would be the first to receive water. Women headed households and landless men received a third of an acre each, and married women receive a quarter of an acre.

Comparing the three villages in terms of villager participation, it is clear that the distribution of irrigated plots in Msosa made a significant difference in the amount of labor and money villagers were willing to contribute to the rehabilitation project. Even the disastrous flooding that badly damaged the newly rehabilitated scheme and held up the distribution of water to the area of newly allocated plots for five years did not discourage villagers' efforts to complete the rehabilitation of their scheme. After the floods, village leaders collected an additional 1.2 million Tsh (\$1525) for repairs and the construction of a new weir. Farmers contributed an average of 2200 Tsh (\$2.60) each, even though most had not yet been able to cultivate their new fields. In addition to their monetary contributions, villagers provided all local materials and labor required for this second major phase of the rehabilitation.

Lessons from a comparative analysis of participation in the planning of a rehabilitation project and the formation of an irrigators' organizations

Section three provides a more in depth comparison of the participation of villagers in the planning and implementation of Kikavu Chini's and Mtandika's rehabilitation projects, and section four examines participation issues in the formation of their irrigators' associations. A series of lessons and recommendations are drawn from the analysis.

- *Participation should begin before a project is planned.*
- *Villagers should participate in planning the design of a rehabilitation project.*
- *Villagers should be involved in financial planning and monitoring of a project.*
- *Participation is more effective if women, youth, and tenants are involved.*
- *Small group planning meetings for groups that are usually not included in decision-making should be held prior to village-wide planning meetings.*
- *Contracts that are developed in a participatory way can make all parties to the rehabilitation accountable to one another.*
- *Participation is cost-effective; it saves more than it costs.*

Training

Section five describes the training each project offered for leaders, water distributors, and farmers. The research found that training and support for irrigators' organizations on financial issues has been deficient in all projects. Lack of adequate financial planning and management skills can threaten the sustainability of the scheme because farmers resist paying water fees when they do not know with how their money is being used or do not agree with the financial decisions of the leadership. Section five also discusses the content of gender training and issues related to agricultural training and training for water distributors. Among the lessons learned are the following:

- *Leadership training should be integrated into participatory planning processes.*
- *Training in financial planning and financial management is critical for sustainability.*
- *Training for government staff and villagers in gender and socio-economic analysis helps increase the participation of women and youth and can also increase the benefits they are likely to receive from the rehabilitation process.*
- *Participatory methods should be used to choose farmers to be trained in agriculture. Training should be spread among as many people as possible.*
- *Village leaders need links to district staff for follow-up training and support.*

Land distribution as a means of increasing participation, equity, and sustainability

Section six takes a closer look at Msosa's plot distribution process. It analyzes why and how the village council succeeded in distributing irrigated plots to the landless and why women got priority access to the land that was distributed. The complexities of women's

land rights are considered in some detail, and the problems created by a single dissenter to the distribution are recounted. Msosa's experience with land distribution demonstrates how a more equitable distribution of project benefits increases farmers' labor and monetary contributions to a rehabilitation project. Thus land distribution improves the prospects for capital cost recovery. .

Costs and benefits of a rehabilitation project for different groups of farmers

Section seven analyzes the costs and benefits of a rehabilitation project for different groups of farms. Because the rehabilitation of an irrigation scheme increases land values, landowners receive most of the benefits. Owners can charge higher rents, which prompts some owners to rent out land they had previously allowed to their sons and wives to farm on their behalf. The benefits to owners are therefore costs to tenants (who often pay higher rents even before they have harvested the prior season's crops) and to women and youth who sometimes lose access to irrigated land they do not own but had farmed before the rehabilitation.

Section seven argues that a more equitable distribution of costs and benefits can improve the prospects for capital cost recovery in irrigation rehabilitation projects and enhance the prospects for farmer participation in activities that will improve the environmental and technical sustainability of the scheme. The section concludes by reviewing measures that can be taken by an irrigation project to promote a more equitable distribution of benefits and costs. These include increasing the command area and distributing newly irrigated plots to the landless, encouraging villagers to develop a plan to redistribute a portion of very large farms to landless women and youth, and paying landless people for their work on a rehabilitation project.

Summary of lessons-learned and recommendations

Section eight draws together the lessons and recommendations of the research. They are:

- 1. If villagers' rights as owners of their traditional irrigation schemes are not respected during the planning and implementation of a rehabilitation project, the sustainability of the scheme can be seriously compromised.*
- 2. Mutual accountability among implementing and funding agencies, contractors, and villagers is critical to ensure cost-effective implementation and technical sustainability. Accountability should be secured with legally enforceable contracts.*
- 3. District staff should participate in the planning and implementation of rehabilitation projects. This will help staff gain the skills needed to collaborate more effectively with villagers both during and after the rehabilitation.*
- 4. Many government officers and technical staff need to be better trained in participatory methods of irrigation project planning, implementation and monitoring.*

5. *Training must not depend on donor funding alone. Districts must have funds for follow-up training and support of irrigators' organizations.*
6. *Managing an irrigation scheme is a difficult job. Irrigator's organizations must learn to operate and maintain their schemes effectively before taking on other functions like marketing. New irrigators' organizations should become associations, not cooperatives.*
7. *Water Fees: The collection of government imposed water fees by newly formed irrigators' organizations can threaten the sustainability of the organization if leaders do not yet have the skills to manage money in an open, participatory, and effective manner. If the annual water fees are not equitably assessed, the legitimacy and sustainability of irrigators' organizations will be further damaged.*
8. *Land and Labor Issues: Irrigation rehabilitation projects change land values and income distribution. Owners are able to charge higher rents, which can reduce the access of landless tenants, wives, and young people to irrigated land. Rehabilitation projects should encourage villagers to develop socially acceptable ways of reducing the inequitable concentration of benefits on landowners. Funding agencies should consider making financial assistance conditional upon the development of a plan for redistributing newly irrigated plots or plots over a certain size.*
9. *The success of capital cost recovery for irrigation projects depends heavily on the distribution of scheme benefits. Landowners, as major beneficiaries, should contribute to cost recovery based on the amount of land owned. If tenants and laborers are not expected to receive plots, they should not be expected to contribute to cost recovery.*
10. *Social and cultural issues: The social marginalization of women, youth, and the landless restricts their participation at all stages of an irrigation rehabilitation project. A participatory analysis of the social and cultural constraints on marginalized groups can help villagers develop locally appropriate ways to help these groups benefit from the project. Standard methods of gender analysis training can facilitate this analysis.*

I. INTRODUCTION

It is widely agreed in principle that community participation in the planning and implementation of irrigation projects tends to improve their technical, economic, and social outcomes, thereby increasing sustainability.ⁱ On the other hand, the critical questions about who should participate (owners? tenants? laborers?), when, and how are more contentious. But even when staff and village leaders agree on the types of community participation they would like to foster, government officers sometimes have problems getting adequate support to work with participatory methods. This indicates that policy makers may not fully appreciate how participation contributes to cost effectiveness as well as project success. These are some of the key issues that motivated the research reported on here.

By studying three actual processes of rehabilitating and managing traditional irrigation schemes--one that used a conventional approach and two that worked with more participatory methods--we sought to better understand how government and communities can increase participation and improve sustainability. By collaborating with different groups of farmers (owners, tenants, laborers) we hoped to bring the issues that they consider critical to their ability to benefit from their rehabilitated schemes to the attention of policy makers.

The research objectives were:

- To learn how government and NGOs can support effective community participation in the rehabilitation of traditional irrigation schemes;
- To provide an opportunity for community groups to analyze their priority issues in irrigation projects, and to bring their views to policy makers.
- To assess the costs and benefits of participation in rehabilitation projects for different groups like land owners, tenants, laborers, men, women, youth; and
- To analyze land, water, and labor issues that affect both the capacities of different groups to benefit from the project as well as the prospects for project sustainability.

These objectives were all addressed in the research. The first two shaped the research as it was being carried out. This, we think, is the nature of participatory research. The third objective is discussed mainly in section seven, although both of the final objectives, like the first two, have also been woven into arguments made throughout the report.

1.1 Research team and collaborators

The research was conducted by members of the Irrigation Section of the Ministry of Agriculture, the Economic and Social Research Foundation of Dar es Salaam, and the African Studies Center at Boston University with the close collaboration of villagers from Kikavu Chini village in Kilimanjaro Region, and Mtandika and Msosa villagers in Iringa Region.ⁱⁱ The research team also benefited from the collaboration of members of the Kilimanjaro Zonal Irrigation Unit in Moshi, the Traditional Irrigation Improvement

Programme (a national NGO with headquarters in Moshi), and government staff in Iringa Rural and Hai districts.

The research was carried out in two phases from January to March 2000 and from June to August 2000. Funding was provided by a competitive research grant from a collaborative research support project funded by USAID called BASISⁱⁱⁱ.

The major participants in this research were the 200 villagers who joined discussion groups during the first phase of the research and the 50 who then volunteered to work as researcher-enumerators for a sample survey carried out during the second phase. The contributions of these village research collaborators form the central content of this report.

Other major collaborators were the In Charge and other staff from the Irrigation Section of the Ministry of Agriculture and Cooperatives. The Irrigation Section helped shape the research questions and assisted the team in choosing research sites. District staff at the research sites also contributed by suggesting more intensive investigations of specific issues, adding new insights, and providing alternative interpretations to confusing findings.

1.2 Research Methods

During the January to March fieldwork period, the research team worked in two villages, Kikavu Chini and Mtandika. We invited all interested villagers to join discussion groups that were organized for village council members, irrigators' organization leaders, water distributors, and male and female owners, tenants, and laborers. During these small group meetings, people discussed the expectations they had formed about the rehabilitation project, their own participation at different stages of the project, their assessment of outcomes, and their analysis and ranking of remaining problems. The fieldwork in each village culminated with an all-village meeting where each group presented its analysis to the community.

During the June to August fieldwork period, a one week was spent in Msosa village discussing the land distribution that had taken place during the irrigation scheme rehabilitation. The rest of this period was spent in Kikavu Chini and Mtandika working with a volunteer team of village enumerators to finalize and administer a research survey to explore the quantitative aspects of the findings of the first phase of the research. Twenty to 25 village enumerators interviewed 80 randomly chosen farmers at each site. Preliminary results from the surveys were analyzed immediately and discussed in village wide meetings.

At the end of the fieldwork period, 50 villagers and government/NGO staff who had collaborated in the research came together in a two-day workshop. Fifteen villagers presented their own analyses of the achievements and problems of their rehabilitation projects. Government officers from the Irrigation Section, the Department of Cooperatives, the Ministry of Community Development, and the Ministry of Water also discussed issues related to community participation in irrigation rehabilitation projects.

Workshop participants developed recommendations to assist government in developing more effective participatory approaches to working with village run irrigation schemes. (Annex One provides a more comprehensive description of research methods and Annex two outlines the workshop program and recommendations.)

1.3 Definitions

Traditional irrigation schemes and rehabilitation projects

In Tanzania traditional irrigation schemes are largely gravity flow water conveyance systems originally constructed by villagers who partially dammed a river with local materials in order to divert water into a system of canals. At the junctures between main and secondary canals, traditional mud division structures are used to control the direction of the water flow. The main weir (the intake structure on the river) often deteriorates rapidly and can be washed away in heavy rains. Thus farmers spend a lot of time maintaining and rebuilding their scheme.

Government and donor sponsored rehabilitation projects usually involve rebuilding the intake structures and division boxes with more permanent materials (stone and concrete). The Irrigation Section of the Ministry of Agriculture and Cooperatives often provides the technical assistance for the design of the rehabilitation and may also chose a contractor to implement the project. In some cases, NGOs assist villagers with rehabilitation projects.

Conventional and participatory approaches to irrigation rehabilitation projects

Conventional approaches to traditional irrigation scheme rehabilitation projects rarely involved villagers in project planning. Engineers designed new weirs, gates and canals based on topographical and hydrological surveys in which villagers took no part. Villagers participated mainly by providing free labor for the construction. One of the villages studied, Kikavu Chini, is an example of a conventional approach.

Participatory approaches were rarely used before the 1990s. They are increasingly used by both the Irrigation Section of the Ministry of Agriculture and by NGOs. Mtandika and Msosa are examples of early participatory approaches.

What is participation?

Participation can be defined in many ways, ranging from providing free labor (a very old concept) to continuous villager-government-NGO-donor discussion of all the engineering, financial, training, and organizational development issues that come up in the planning and implementation of a project.

There are four main “moments” of participation in irrigation rehabilitation projects:

- Participation in planning the physical rehabilitation
- Participation in the construction activities

- Participation in developing an irrigators' organization
- Participation in the operating and managing of the scheme

This research project investigated actual experiences of participation, focusing on *who* participated, *when* they participated, *how* they participated, and with what effect. We asked people (from different groups like owners, tenants, laborers) to describe what motivated them to participate, and what they expected from the rehabilitation. Then different groups described their participation (or non-participation) in the planning, construction, and operation of the scheme and in the development of the irrigators' organization. During these discussions, people analyzed the relationships between participation and the prospects for sustainability of the scheme. They also analyzed the costs and benefits of their participation.

What do we mean by sustainability of an irrigation scheme?

There are several aspects to sustainability: physical, environmental, economic, and social or organizational. We focused on the following issues:

- Will the scheme last technically? Is the engineering adequate? Can villagers accomplish the needed repairs?
- Will the scheme be environmentally sustainable? Is it threatened by erosion?
- Has the rehabilitation increased the efficiency of water use and the economic viability of farming? If so, is it likely that these community benefits will be sustained over time?
- Will the villagers who own the rehabilitated scheme be able to maintain and operate the scheme effectively over time?

1.4 Main Arguments

Participation enhances sustainability.

This research strongly suggests that the wider the participation, the greater the prospects for sustainability. Furthermore, the greater the number of people and the number of social groups (women, men, owners, tenants, elders, youth) who participate in all the “moments” of participation (planning, implementation, operation), the greater the probability that the benefits of a rehabilitation project will be sustained over time. We also have some evidence that the converse may be true. Less participation decreases the prospects for sustainability.

Why should this be so? Our evidence points to the importance of several factors. Participation in planning can help reduce design mistakes. Participatory discussions of the design may also help convince people that technical choices they did not think were correct are, in fact, a good choice. If engineers listen to farmers' concerns, the design may be improved. If, on the other hand, there is little participation and people are

skeptical about the design or the contractor, they will be less willing to contribute funds or labor to the rehabilitation.

Participation increases the prospects for social and economic sustainability because it gives people a greater understanding of how the rehabilitated scheme will work technically, how they can avoid breakdowns, and how everyone's contributions to good maintenance and proper operation can increase benefits for all.

The wider the participation in forming and operating the irrigators' organization, the greater the probability that the organization will be run in a financially responsible manner. If villagers are well informed about the financial affairs of the organization, the leaders will have no choice but to be accountable to the members. This will have a significant positive impact on farmers' willingness to cooperate with the leadership they have chosen.

The benefits of rehabilitation projects are not equal for all farmers. Measures that increase spread benefits more widely will improve participation and contribute to the sustainability of the scheme.

One of the most important, but generally ignored outcomes of a rehabilitation project is the great probability that unless special measures are agreed to before construction even begins, the project is likely to bestow nearly all its benefits on landowners. It may even result in greater costs than benefits for other groups like tenants, youth, women.

We argue that if the Irrigation Section, NGOs and donors do not pay attention to the social distribution of benefits and do not try involve communities in discussing ways to improve the equitable distribution of both benefits and costs, the rehabilitation process is likely to have problems with both participation and sustainability.

Our evidence suggests that people who expect to benefit from a rehabilitation project are far more motivated to provide labor and financial inputs into the project than those who don't. This was very strongly evident among landless people who received plots due to the rehabilitation in Msosa village. We also found that people who have participated effectively and have benefited from the project are highly motivated to cooperate in running the scheme efficiently after the rehabilitation is complete. Finally, we found that people who are excluded from participation in planning or in the irrigator's organization are likely to be bitter, disillusioned, and far *less* likely than others to cooperate in properly operating and maintaining the scheme, thereby reducing prospects for sustainability.

These arguments are built on the evidence and analysis provided by villagers, government officers, and others who collaborated with the research. They will be repeated in the report when we are discussing the evidence seems to support them.

1.5 Structure of the report

The next section provides an overview of the research sites, including a brief history of the irrigation schemes and a review of major issues highlighted by each case. This section provides the reader with evidence for the report's arguments and for the lessons discussed in the following sections. Section three focuses on the participation of different community groups in the planning and execution of the physical rehabilitation itself. Section four examines issues related to the formation of irrigators' organizations. Section five reviews training experiences and training needs at the village level. Section six takes a closer look at the methods and effects of land distribution in Msosa village. Section seven analyzes the costs and benefits of participation from the perspectives of male and female landowners, tenants, and laborers and of different age groups. Section eight draws together the major lessons learned.

II. OVERVIEW OF RESEARCH SITES AND ISSUES

This section describes the villages and irrigation schemes where the research took place: Kikavu Chini in Kilimanjaro Region and Mtankika and Msosa in Iringa Region. It reviews the history of each irrigation scheme, the rehabilitation processes, and the formation of irrigators' organization. This review of actual experiences of participation (and non-participation) is based on the analyses of the villagers who took part in the research. It provides the evidence for the comparative analyses presented in later sections and for the lessons learned.

2.1. Kikavu Chini

2.1.1 Major issues

The rehabilitation of Kikavu Chini's irrigation scheme was planned and carried out as part of a larger United Nation's (UNDP) sponsored project whose goal was to enhance the competence of the Kilimanjaro Zonal Irrigation Unit (of the Ministry of Agriculture's Irrigation Section) while improving irrigation water supplies in several traditional irrigation schemes. The project began in the late 1980s, before much attention was being paid to participation issues. It is an example of the conventional approach to rehabilitation projects.

The major issues illustrated by this case are:

- How the lack of adequate involvement of villagers in planning and monitoring a rehabilitation project can reduce people's willingness to provide unpaid labor.
- How inadequate collaboration with villagers can blind design engineers to the severity of environmental problems that can threaten the technical sustainability of a rehabilitated irrigation scheme.
- How developing an irrigators' organization as a cooperative tends to make the tasks of running an irrigation scheme more difficult.

2.1.2 Location, irrigation scheme history, farming system

Kikavu Chini is located on the sandy plains below the southern slopes of Mt. Kilimanjaro. It was founded in the early 1940s by Chagga and Pare farmers seeking land. Low rainfall (600 mm per year) and high evaporation rates make rain-fed farming extremely risky.

Farmers began developing a traditional irrigation scheme soon after settling in the area. In 1947 they built a traditional weir to divert water from the Kikavu River and dug a series of canals leading to their fields. Over the years, farmers expanded the scheme to 900 acres.

Until 1999 the scheme was managed by a furrow committee of water distributors under the supervision of the village council. When farmers who failed to help maintain the scheme or stole water were fined, the money went to the village council and was not always used for scheme upkeep.

In 1999, Kikavu Chini had a population of nearly 3000, an average size village in Tanzanian terms. The irrigation scheme is farmed by about 760 farmers, including 430 land owners, 230 tenants, and 100 laborers.^{iv} The village is also home to at least 150 people who work on a huge nearby sugar estate (Tanganyika Planting Company or TCP) and to a large number of shop owners, traders, and *fundis* (vehicle repairers, masons, carpenters, etc.)

Territorially, Kikavu is quite small, only 1600 acres in all. The irrigation scheme dominates the landscape taking up 1000 acres. The 1994-97 rehabilitation added 100 acres to the scheme, and if it had been completed as designed, the scheme would have covered virtually all of the arable land in the village.

The major crops grown on the scheme are rice, maize, beans, and bananas. Rice, the cash crop, is grown in two seasons, but only by a third of the farmers. (Only 300 of the scheme's 1000 acres are suitable for rice.) All farmers grow maize for family consumption, and most follow the maize with beans, which are grown as a cash crop by farmers without access to rice plots. Some farm households, including many women headed households, grow bananas, the main ingredient in the local brew. A few women also grow vegetables as a cash crop, but water is often insufficient to support this enterprise.

2.1.3 The Rehabilitation of 1995-1998

The rehabilitation of the traditional irrigation scheme at Kikavu Chini was designed and implemented under the direction of the Kilimanjaro Zonal Irrigation Unit (KZIU). It was part of a larger project to improve the water supplies in several irrigation schemes that was funded by the United Nations Development Programme (UNDP) and the Royal Norwegian Embassy.

The KZIU chose the schemes to be rehabilitated. Kikavu Chini was apparently chosen because the village had suffered from serious flooding due to the instability of the riverbanks at the site of the traditional weir and intake. The villagers did not initiate the process, but they did formally apply when offered a project. Most projects started this way in the 1980s, largely because the government could only undertake large projects when external funding was available.

Villagers in Kikavu Chini were not involved in planning or monitoring the rehabilitation. When plans for the rehabilitation changed due to funding limitations, villagers were not informed about the reasons for the changes or their implications for the scheme. The marginalization of the community from its own irrigation scheme had several negative effects:

- Low levels of farmer participation in unpaid labor increased the financial costs of the rehabilitation project.
- Lack of knowledge about the project generated mistrust and reduced farmers' willingness to contribute even further.
- Low levels of farmer participation in unpaid labor depleted project funds even faster than expected, leaving the scheme with serious technical and environmental problems.

Rehabilitation and new construction

The rehabilitation in Kikavu Chini was really a hybrid of rehabilitation and new construction. A new weir was built three kilometers up river from the old intake. This required the construction of a new main canal 2.6 kilometers in length. Four new off-takes were built on the new canal, increasing the size of the scheme by over 10 percent. The new main canal connects to the traditional main canal near the original intake. Even though the traditional portion of the scheme, which serves 80 percent of the farmers, was largely untouched, and much of the design was not finished as planned, Kikavu Chini's rehabilitation project cost over \$1,800 US dollars per hectare. If it had been completed as planned (with a second main canal to irrigate 400 more acres), it was estimated that it would have cost \$4,800 per hectare.^v

One of the most important facts to understand about Kikavu Chini's rehabilitation project is that there was a major discrepancy between the projected cost of the scheme when it was designed in the mid-1980s and the money available in the mid-1990s. The KZIU coped with this problem not by changing the original design, but by leaving out parts of it. This produced a long list of technical problems in the incompletely rehabilitated scheme that was handed over to the village council in December 1998. Some of these problems are more important than others, but it is worth looking at them all in order to appreciate the magnitude of the challenge facing the irrigators' organization.

Technical problems remaining after the rehabilitation

The major change made due to lack of adequate funds was not building a second main canal (the Upareni canal) that would have irrigated 400 more acres. This decision, however, was taken without changing the design of the new weir, which now has far more water intake capacity than needed. When logs jam the intake gates, too much water flows into the system and dislodges the concrete slabs that line the main canal. In the first year of operation of the rehabilitated scheme, the irrigators' association has spent a great deal of time and money repairing main canal.

During the rainy season, sheets of mud sweep down the escarpment that runs parallel to the new main canal and fill it with silt. Major gullies on the escarpment also threaten to break through this canal. Villagers have tried various methods to block or redirect the water rushing down the escarpment, but their earthen structures are regularly washed away. A permanent solution requires far more extensive (and expensive) anti-erosion structures. Some observers, like the Sokoine University team that evaluated the rehabilitation in 1998, have suggested the potential for severe damage to the new main canal from major gullies is the most serious technical problem threatening the sustainability of Kikavu Chini's irrigation scheme.^{vi}

Financing to solve these environmental problems was not budgeted at the beginning of the project, apparently because the design engineers did not recognize their severity. If villagers had been more actively involved in the planning of the rehabilitation project, environmental issues might have been taken more seriously.

Solving the gully problem will cost a good deal more money than the villagers can raise on their own. Even though the scheme is now providing a more dependable water supply and output is rising, farmers' profits are not rising at the same rate due to drastic increases in the prices of inputs and far greater risks of price declines at harvest. (This is the result of the forced liberalization of the economy and the dismantling of crop price guarantees.^{vii}) Thus, the rehabilitation has left villagers with a massive problem that they cannot solve without more external assistance.

There is also a continuing problem of water management in the traditional part of the scheme that serves 80 percent of the farmers. Since the project did not improve the simple mud and stone division structures traditionally used to open and close the canals, the efficiency of water use in the traditional portion of the canal is still low.

As important as all these problems are, however, none can match the severity and labor draining effect of the problem known as *Kwa Raphaeli*. *Raphaeli's* farm marks the site of a one hundred meter breach in the original main canal that sends at least half the water in the system right back into the river.^{viii} This water is lost before it can get to 80 percent of the farms in the scheme. The only thing preventing a total loss of water is a villager built, 100 meter long dam-like structure constructed of wooden poles and crop residues. Every Monday, the farmers who are scheduled to receive water that week spend the day repairing this dam.

According to the Kilimanjaro Zonal Irrigation Unit, a permanent solution to the *Raphaeli* problem requires re-digging the canal to move it away from the riverbank. This would cost \$7000 if the villagers were to provide free labor, or \$18,000 with hired labor. This amount is little more than one percent of the \$667,000 that has already been spent on the scheme.^{ix} These figures bring two questions to mind: Why was such a serious problem that cost so relatively little to repair left untouched? And why have the relatively low financial costs of making this repair not been discussed with the leaders of the irrigators' organization?

2.1.4 The formation of Kikavu Chini's irrigators' cooperative

Kikavu Chini's current irrigators' cooperative, *Uwakichi*, came on the scene very late. It began operating in November 1999, almost a year after the newly rehabilitated scheme was formally handed over to the village. Until *Uwakichi* was registered, the management of the irrigation scheme was the responsibility of a water committee of the scheme's water distributors that was officially part of the village council. The water distributors prepared weekly water distribution schedules and organized scheme repairs with the farmers on their respective canals. Two of them even managed to build modern concrete division boxes for their canals. On the other hand, because village council controlled most of the money collected from fines and other charges, there was rarely money available for general repairs and maintenance. The water distributors wanted an independent irrigators' organization that would manage its own funds.

Two attempts to form an irrigators' organization

In 1997, the Kilimanjaro Zonal Irrigation Unit (KZIU) requested the Cooperatives Department (which is also under the Ministry of Agriculture) to help villagers form an irrigators' cooperative. The Cooperative Department, knowing little about the needs of an irrigators' organization, set up a conventional cooperative, called *Ukuki*, that was focused on marketing.

The KZIU used rehabilitation project funds to train *Ukuki's* leaders. The training was quite extensive, including leadership training, water management training, and even two trips to Egypt and to Zimbabwe to visit irrigation schemes, but it apparently had little positive effect. *Ukuki*, had only 62 members when it folded after losing its funds in a leadership scandal.

Unfortunately, this type of problem has been fairly common in Tanzanian cooperatives. A 1998 evaluation of the Kikavu Chini rehabilitation project noted that "due to the bad past experiences which farmers had with the cooperatives, *Ukuki* in its present set up will not be accepted by the majority of the villagers".^x

After *Ukuki* folded, the UNDP, which had provided most of the rehabilitation projects funds, once again insisted that an irrigators' organization be formed. Surprisingly, the KZIU again requested the Department of Cooperatives to assist villagers in forming another cooperative.^{xi} The village council was not informed that an irrigators' organization could have been structured as an association.^{xii}

Thus, in mid-1998, only six months before the ceremony that gave the village full financial and management responsibility for the rehabilitated scheme, the village council appointed an “interim committee” to form another cooperative and sign up members. Given the villagers’ recent memories of losing money to the *Ukuki* cooperative, the job of the interim committee was not easy. Two years later the new irrigators’ cooperative only had 78 members.

The assistance the interim committee charged with forming the new irrigators’ organization received from the Cooperative Department was not tailored to their needs. Neither the cooperative officer nor the interim committee seem to have drawn on the water distributors experience in running the scheme when setting up the constitution and by-laws. There is no provision that water distributors be included in *Uwakichi*’s executive committee.

Problems with the cooperative model

Uwakichi’s constitution was largely copied from the standard constitution used in most Tanzanian cooperatives. It requires *Uwakichi* to open a shop to supply agricultural inputs and to market members’ crops. As soon as it was registered, *Uwakichi* rented an office and an adjoining room for its shop. Since its prices are higher than those of the private retailers with whom it must compete, however, the shop’s turnover is low and it is probably not making a profit. The cooperative model has also forced *Uwakichi* to hire a full time secretary. All these expenses have been undertaken without a financial analysis of how much of the organization’s revenues they are taking up. (Revenue is mainly from the obligatory water fee of 2000 Tsh (\$2.50) per acre per year paid by all farmers using the scheme.)

Uwakichi’s financial obligations will soon increase dramatically because the Ministry of Water is in the process of imposing an annual water fee on all irrigation schemes. The estimated cost for Kikavu Chini is one million shillings (\$1250) about half of *Uwakichi*’s projected annual revenue from water fees (at a 100% payment rate).

As a result of all *Uwakichi*’s fixed expenses (office rental, shop rental, paying a secretary, paying a small fee to water distributors, etc.) and its other obligations like paying for its registration and for the new annual water fee, it seems quite unlikely that the organization will have funds to accomplish what the farmers think they are paying their water fees for, like the construction of badly needed water division boxes in the traditional canals.

Because financial issues have not been properly analyzed and discussed with *Uwakichi* members, and due to this recent history of corruption in the former cooperative *Ukuki*, there is a danger that *Uwakichi*’s difficulties in planning and controlling its expenditures will bring it down even if there is no financial malfeasance whatsoever. (We hasten to add that we think it unlikely that there has been any illegal use of *Uwakichi*’s funds.)

Thus far, very few farmers have joined the organization. By August 2000, *Uwakichi* had only 78 members, 58 men and 20 women. This is a mere 20 percent of the scheme's landowners. Non-members have little chance to bring their problems to the leadership. Because they are not involved meetings or decision-making, they also have less information about how their actions affect the operation of the scheme and may be more tempted than members to break its rules. This can compromise the sustainability as well as the efficient operation of the scheme.

Social cleavages

The 230 tenant farmers and 100 laborers farming in Kikavu Chini's irrigation scheme are barred from membership by *Uwakichi's* constitution. Tenants are particularly distressed at their exclusion. Because they want a forum in which to discuss their issues, a few tenants are discussing the possibility of forming their own organization. Some *Uwakichi* leaders see this as a threat.

The fact that tenants have been barred from the irrigators' organization seems to be related to larger social tensions in the village. Kikavu Chini has experienced several interwoven sources of social tension, the most important of which seem to be a palpable animosity between younger men and an older generation used to wielding power. There are also socio-economic divisions between land owners, on the one hand, and tenants and laborers, on the other, and gender tensions between men and women farmers over issues of access to land and water. These tensions have erupted in bitter competition among contesting political parties. They have also contributed significantly to the difficulties of managing an irrigation scheme. They foster mutual suspicion, make any issue more volatile, and seriously constrain the participation and cooperation needed to solve the serious technical and environmental problems threatening the sustainability of Kikavu Chini's irrigation scheme.

Accountability and Sustainability: Who is responsible? Who should assist?

When the zonal irrigation unit and the donors handed the scheme over to the village in December 1998, the village was left with a whole series of major and minor technical problems. The transfer ceremony signaled the shift of responsibility for dealing with these problems from the state (which initiated but did not complete the rehabilitation) to the village (which at that time did not even have a proper irrigators' organization). Even now, many villagers describe the new irrigators' cooperative as "young" or "weak". Nonetheless it is in principle responsible for solving a series of serious problems that need to be dealt with in the next two or three years if the rehabilitated irrigation scheme is to avoid chronic, if not fatal, breakdowns. Although no serious observers have suggested that all these problems can be solved with the limited means available to villagers, *Uwakichi* has not been offered financial assistance or advice on how to seek it.^{xiii}

The *Uwakichi* leaders are unpaid and inadequately untrained volunteers. Although they are working hard and learning fast, they have very limited experience in managing an

irrigation scheme. They are ill prepared to do the financial planning required run the scheme or to prepare formal requests for the kind of financial assistance they require.

We do not attempt to answer our rhetorical questions about who is responsible for this situation or who should assist *Uwakichi* in dealing with the enormous challenges it faces. These questions, however, must be posed and pondered by the Irrigation Section and district governments if this particular rehabilitation is to succeed and if other projects are to avoid plunging villagers into similar situations.

2.2 Mtandika

2.2.1 Major issues

The traditional irrigation scheme in Mtandika village has been rehabilitated twice with external support. The European Economic Community (EEC) built a new weir in 1982 and the Dutch funded Traditional Irrigation Improvement Programme (TIP) supported a more comprehensive rehabilitation in 1995-97. We focus on the TIP rehabilitation because it provides examples of methods for involving villagers in planning and implementing a rehabilitation project and for transforming a traditional furrow or water committee into a water users association (WUA).

The major issues illustrated by this case are:

- How a wide range of villagers can be drawn into the planning of a rehabilitation project.
- How district authorities and technical officers can be integrated into the planning processes without taking over.
- How women can be effectively integrated into the planning and implementation of a rehabilitation project and an irrigators' organization.
- How large differences in the size of landholdings can reduce cooperation in scheme maintenance.

2.2.2 Location, farming system, scheme history

Mtandika is located in Iringa Rural District, about an hour's drive east of Iringa town. Territorially, it is a huge village, spread over 75,000 hectares and extending 20 kilometers along the main road from Morogoro to Iringa. Its population, however, is only 2500^{xiv}. The number of farmers in Mtandika and in Kikavu Chini is about the same. Most villagers are from the local Wasagara ethnic group, but there are also small numbers of Wahehe people from Iringa and Maasai from the northern plains.^{xv}

Before Tanzania's 1974 villagization forcibly moved people into large villages, Mtandika's households were scattered along the Lukosi River, a major tributary of the Rufiji River. Currently villagers are grouped in five sub-villages. Only three of the sub-villages are located close enough to the irrigation scheme to make farming there feasible. Farmers in the other sub-villages rely on riverbank fields to grow basic food and cash

crops like maize, beans, and vegetables, sometimes supplementing them with drought resistant crops planted in rain-fed fields. In this semi-arid area, however, where rainfall averages only 430 mm a year, only desperately poor people risk farming in rain-fed fields. About 40 relatively wealthy villagers have purchased pumps to irrigate large farms of 10-20 acres each along the Lukosi River. (This research project did not study private pump irrigation.)^{xvi}

Mtandika's traditional irrigation scheme, called Mgambalenga, was developed in the early 1970s when riverbank plots started becoming scarce. Today its command area is 430 acres, less than half the size of Kikavu Chini's scheme. Mtandika's scheme cannot be extended further due to limited water in the Mgambalenga River.

About 350 farmers own plots in the Mgambalenga scheme. Another 33 farmers are tenants who own no land, and 27 are landless laborers.^{xvii} Many men who own small plots also rent plots from larger farmers, and many wives of owners also work as seasonal laborers. Nearly all farmers grow maize and beans for household consumption during the rainy season (December to May). Onions, the main cash crop, are grown from May to September.

History of the Mgambalenga Irrigation Scheme

In 1970, a group of 15 farmers built a simple weir in a rocky area of the Mgambalenga River to divert water into nearby fields. A few years later, the original founders convinced 25 more farmers to expand the scheme by building a masonry weir and by digging a long main canal to an area of better soils. These 40 founders soon irrigated over 100 acres.

The growth of the scheme had implications for Mtandika's neighbors in Kkula who also have an irrigation scheme on the Mgambalenga River. Since the river is small and depends on rain for its water, by the mid-1970s, the two villages needed a water-sharing agreement. In 1975, the Ward Development Committee brokered an agreement giving Mtandika water from December to mid-August. After that Kkula could take all the water.

The EEC rehabilitation of 1982

In 1982 the European Economic Commission (EEC) built a new concrete weir that allowed another major expansion of the scheme. Villagers did not participate in the planning of this rehabilitation, but they *were* required to provide free labor.

The post-1982 rehabilitation period saw a great expansion of irrigated agriculture. As onion production expanded in the 1980s, most farmers increased their incomes. A few even managed to purchase pumps that allowed them to irrigate new land along the Lukosi River.^{xviii}

Up to the mid-1980s, the founders had managed the scheme with the help of water distributors. As Mgambalenga expanded after the EEC rehabilitation, the founders had

increasing problems managing the scheme on their own. As one founder recalled, “In 1986 we formed a water committee because we had trouble getting everyone to work.”^{xxix} The new water committee reported to the chairman of the village. It was composed of five officers plus the water distributors. Its functioning, however, reportedly left much to be desired, both in terms of fairness of water distribution and vigilance in stopping water stealing.

After the EEC rehabilitation, the village council took over the responsibility of distributing land in the scheme. It soon distributed nearly 300 acres to about 200 farmers. In the 1980s, the village council allocated plots with little attention to equity. Many people who had been given plots earlier received more land, even though young people just out of school and women who headed their own households had to rent plots from farmers who had been given a lot of land.^{xx}

By the late 1980s, land ownership in the scheme was highly skewed. Half the 400 or so owners had plots of one acre or less, often too small to fulfill both food and cash needs. About 50 people had two plots, enough for both subsistence and cash crops, and 42 landowners controlled three or more plots. The large owners rented plots to about 50 landless tenants.^{xxi}

By the late 1980s, however, many people had to leave at least a quarter of their land uncultivated because the amount of water reaching the fields had declined. There were two main reasons for the scarcity of water: sand clogged the EEC intake, and weeds reduced water flows in the canals. Both problems reflected poor cooperation in scheme maintenance.

Poor scheme maintenance was related to the skewed pattern of ownership. Since larger owners could afford to leave large parts of their fields fallow, they had little motivation to cooperate in scheme maintenance. This discouraged small farmers and tenants who realized that if they worked without the large owners, the benefits would still go mainly to the wealthier farmers. (We return to this issue of a relationship between equity and participation in other sections of this report.)

Then in the spring of 1992, disaster struck. The EEC weir was washed away in a flood, leaving the entire scheme without water and forcing farmers to abandon their fields.

2.2.2 The TIP Rehabilitation: 1994-97

At the time of the 1992 Mgambalenga crisis, the Dutch-funded Traditional Irrigation Improvement Program (TIP) was assisting the neighboring village of Msosa with the rehabilitation of its irrigation scheme. When Mtandika farmers discussed the breakdown of their weir with TIP’s project manager, an irrigation engineer, he suggested that the Mgambalenga intake should be moved a few meters upstream to a rocky area with a natural weir of large boulders. This turned out to be a brilliant solution, but it required carving out a new main canal through about 100 meters of 20 foot high rock. The

villagers, although skeptical, followed the engineer's suggestions and managed to break down the rock face by using fire. Three days later they had water in their scheme.

In 1993, the village council began negotiating with TIP for assistance with a major rehabilitation of the Mgambalenga scheme. One woman recalled that, "First TIP talked with the village council, which then called a village meeting. The women were all there. Seven men and seven women were appointed [to a planning committee] from this big meeting." Another woman pointed out that getting women into the planning committee had not, in fact, happened so easily. "In the first committee, there were no women at all. TIP insisted on women. We thought that was very good." ^{xxii}

After several meetings with both the village council and the village assembly, TIP agreed to help the village plan and construct a series of improvements: building a cross gully structure at the intake area, constructing a sand trap, lining portions of the main canal, and rebuilding the scheme's major water division structure.

A formal agreement laying out the financial and labor responsibilities on each side was signed in 1994. TIP agreed to provide an engineer for the project and the district authorities agreed to assign an irrigation technician to the project. TIP would pay for most materials, but the village would need to provide labor and raw materials like stone and sand. The water committee was expected to organize and supervise the unpaid village workers and to purchase and store the inputs needed (using TIP funds). The requirement that the village handle the project funds was unusual at the time. It was a very important innovation because it allowed villagers to gain skills in financial management and avoided the suspicions of misuse of funds that dogged the Kikavu Chini project.

The TIP assisted rehabilitation greatly increased the reliability of water in the scheme. Sand inundation problems were solved, canals were improved, and water distribution became more efficient. Water availability doubled. Except in years of exceptionally low rainfall, farmers can count on irrigating their entire fields.

While most farmers and leaders agreed with the farmer who told us, "We have no big problems now," there is at least one major technical problem. The gate on the sand trap is badly warped. If it bursts before it can be repaired, the scheme will lose most of its water. The WUA executive committee has been aware of the problem for over two years, but has not been able to mobilize the farmers to contribute enough funds to complete the repair.

The problem of the sand trap gate is related to the way that the WUA is linked to the district and national government. The WUA had collected enough funds to fix the door two years ago, but soon thereafter, it was faced with a series of government-mandated payments. First the WUA had to register itself legally at a cost of 50,000 Tsh (\$62.50). Next it had to pay the scheme's water right (a one time charge of 35,000 Tsh or \$44), and now it must be prepared to pay *annual* water fees to the Rufiji River Basin Office. (The amount to be paid has not yet been disclosed).

The collection of the new annual water fee will, in effect, put the WUA in the position of a tax collection agent for the government. Taking on this function could overwhelm the new WUA's quite limited capacities for financial management. People may understand that the WUA must pay these fees because it has no choice, but farmers want their payments to the WUA to be used to keep the scheme in good working order. If the mixing of the two functions causes financial confusion or seems to be reducing the WUA's capacity to perform its primary functions, the WUA's legitimacy as a farmer owned organization can be seriously undercut. (We will make recommendations concerning the collection of the annual water fees in the final section of the report.)

2.2.3 Formation of the Mgambalenga Water Users' Association (WUA)

When TIP agreed to assist Mtandika in 1994, the irrigation scheme was managed by a water committee composed of six elected members and 20 water distributors. The water committee was supervised by the village council, which also managed its money. The water distributors were not happy with this arrangement because "the Village Council took the money from fines and used it for other purposes".^{xxiii}

Soon after TIP signed a contract to assist with the rehabilitation, it began a series of leadership seminars aimed at strengthening the management of the irrigation scheme and forming an independent irrigators' organization. This early focus on organizational development and leadership training made it possible for TIP to undertake the project in a participatory manner from the very beginning. A water distributor described the results of this mixed planning/training approach as follows: "We wanted a Union of Farmers to organize everything related to our scheme. During the TIP training, we learned how to run an organization, and we decided that Mgambalenga should have its own leadership. We had a smooth transition because the TIP seminars involved everyone, the Village Council and the water users." Although the transition to a new type of irrigators' organization was perhaps not as easy as this statement implies, the approach of involving both the village council and the water committee in TIP sponsored training activities was important.

When it came time to decide on what form an official irrigators' organization should, both cooperative officers and community development officers were invited to the planning seminars to discuss the pros and cons of cooperatives versus associations. This information helped village leaders make an informed choice and was highly appreciated. Mtandika and Msosa both opted to form an association.

During 1995 and 1996, the WUA executive committee, the TIP manager, and the local agricultural extension agent, irrigation technician, community development officer met several times to work on by-laws for the association. When the draft by-laws were presented at a general village meeting, villagers were invited to discuss additions, deletions, or other changes. The fact changes were made is evidence of the participatory nature of the process. (In contrast, the process of writing the constitution and by-laws of

the irrigations' organization in Kikavu Chini was criticized as having been top-down, rushed, and not open to villagers' suggestions.)

After the Mgambalenga WUA's by-laws were accepted, the idea of developing a constitution was discussed but not undertaken. In 1999, the district authorities pressured the WUA to write a constitution and register the association with the District Council. As district officers told us, registration was not a felt need, but rather "an externally induced need".

2.2.4 Opening participation and leadership to women

This report argues that wide participation by all categories of farmers is essential for the sustainability of irrigation scheme rehabilitation projects. We therefore want to look a bit more closely at the measures TIP took to assure that women participated in the planning of the rehabilitation and the formation of the irrigators' organization.

The Wasagara are known as a highly patriarchal people who do not like change. When TIP tried to promote women's participation in political bodies like the WUA and in the planning and implementation of the rehabilitation itself, it faced resistance from men and women who felt that these changes violated traditions, including customary beliefs that women's presence at the irrigation intake would risk drying up or polluting the water.^{xxiv} Patriarchal traditions also denied most women access to land in their own right. Prior to TIP's intervention, only women headed households had asked the village council for land. These women were rarely given irrigated land.

Women's lack of access to land was grounded in the customs that kept them away from the intake. If a person did not participate in building or repairing the intake or in digging and maintaining the canals, he (or she) was not eligible to receive a plot of land in the scheme. TIP tackled this constraint head on. It required that women participate in the rehabilitation of the intake, and it paid a women's representative to supervise the work of women's groups. (We discuss this in more detail in section three.) TIP also made sure that women were heavily involved in leadership training and insisted that women be part of the executive committee of the WUA. Women leaders considered both TIP's gender conditions and its gender training as extremely important benefits of TIP's approach.^{xxv}

TIP-sponsored gender training seminars taught men and women tools for analyzing of the different roles and responsibilities of men and women in their own community. This included an analysis of the gendered division of labor, differences in men's and women's access to resources like land, and differences in participation in decision-making. People then discussed ways that gender inequalities affect their irrigation scheme and how they might be changed. This training gradually began to change the attitudes of both men and women about women's roles in irrigated agriculture and in politics.

An older male leader commented that there were many changes resulting from the gender training. "Only recently, we decided that there should be women in leadership. In the past women didn't apply for leadership, we just appointed them. Now they apply."

Another old man added, “Before we marginalized women. Now a woman can have her own land.”

Women’s access to irrigated land in their own right, however, is still highly constrained, in large part because nearly all the land in the Mgambalenga scheme were given out in the 1980s. Only a very few women got land through participation in the rehabilitation. Several women told the research team that, “After the gender training, we regretted that we had not asked for land earlier.” Some women received plots from their husbands or fathers after the training.

The training also convinced water distributors to end discrimination against women farmers. One water distributor remarked, “I now give equal rights to women. We were convinced by the gender training.” Women agreed with this assessment. “Previously men were favored in getting water. Now women don’t have to struggle to get water.”

These changes in gender relations have changed many women’s economic and political situations. Nearly 100 women farmers are now members of the water users’ association. Many of these women farm an irrigated plot on their own account. Five of the eleven members of the current WUA executive are women. All of them stood for elections and won their posts.

Of course women’s problems are not entirely solved. Women still face serious constraints in trying to change their situation by acting socially and politically. A woman leader complained, for example, “We have women’s representatives on the village council, but men are very hard on women who try to press women’s issues and solve women’s problems.”

It has been even harder to reduce the constraints on women’s access to land. Since the WUA took over the distribution of irrigated land 1996, it has distributed about 10 acres of newly irrigated land. In 1998, there were 30 applications for this land, none from women. When we asked the WUA leaders why no women had applied, it became clear that women leaders on the WUA executive committee had never been informed that new plots were being distributed.^{xxvi}

Remaining problems notwithstanding, it is clear that women in Mtandika have made significant progress in breaking down gender based economic, social, and political constraints. Although TIP’s gender “conditions” and gender training were not the only factors in these changes, women’s own analyses suggest that they made an important difference. Furthermore, women are very proud of their new achievements. They pointed out that their participation in the rehabilitation and in the WUA has contributed significantly to the success and sustainability of their irrigation scheme.

2.3 Msosa

The village of Msosa is located adjacent to Mtandika. The rehabilitation of its irrigation scheme was also sponsored by the Traditional Irrigation Improvement Program (TIP).

We added Msosa to the research program because it has an exceptionally interesting history of land distribution that was carried out as a result of the rehabilitation. We think that this case demonstrates that by providing land for the landless, a community can achieve two important goals: wider and more effective participation in the planning and implementation of the rehabilitation project, and, after the rehabilitation is completed, wider and more effective participation in activities that contribute to the efficient operation of the scheme and to its sustainability over time.

2.3.1 Location, scheme history, farming systems

With a population of about 2000, Msosa is smaller than either Mtandika or Kikavu Chini. It was first settled in 1961. Its irrigated farming system is the same as Mtandika's: maize and other food crops are grown during the rainy season and onions are grown from May to September.

Msosa's irrigation scheme abstracts water from a small tributary of the Lukosi River. The scheme was founded in 1967 by ten farmers who dug the first canal. In 1970 a second small traditional weir was built on the opposite side of the river from the original intake, and two new canals were dug. Heavy rains easily washed these small "weirs" away making the delivery of water to the fields very unreliable. The weirs were constantly being rebuilt.

Until the period of villagization in Tanzania (1974-75), Msosa was about a third of its current size. Only 40 households were engaged in irrigated agriculture. Then in 1977 the central government forcibly moved 100 households from the former village of Mbatwa to Msosa. The government promised the Mbatwa families irrigated land, but the original settlers in Msosa forced the newcomers to rent land in order to farm. In the 1980s, Msosa's irrigation had about 50 owners and 150 tenants.

2.3.2 The 1990-96 TIP rehabilitation

Msosa was TIP's first project in Iringa Region. The process of negotiating and planning the rehabilitation was similar to that described for Mtandika, except for the distribution of land. .

Because of Msosa's high rates of landlessness, and because the irrigation experts predicted that a rehabilitation project would allow up to 100 acres of additional land to be irrigated, TIP conditioned its offer to support Msosa's rehabilitation on the willingness of the village council to distribute newly irrigated land to the landless. After some discussion, the village council and its water committee agreed.

The TIP sponsored rehabilitation of 1990-96 replaced one of the traditional weirs with a concrete weir and intake gate. The main canal was lined for 100 meters. Later an

aqueduct was built to transport water to the opposite side of the river. The aqueduct replaced the second traditional weir. When completed, the aqueduct was expected to facilitate an extension of the scheme's command area.

In 1994 the village council distributed plots to 500 people. Landless men got a third of an acre each. The same amount was given to women heading their own households. Married women received a quarter of an acre. All the women's plots were grouped together in the area that would be the first to get water. The men's plots were located just beyond those allocated to women.

2.3.3 The 1998 construction of a second weir

Although the first rehabilitation was essentially finished in 1996, no water reached the newly distributed land until the 1999-2000 rainy season. This delay resulted from problems with the new aqueduct, which was destroyed during the exceptionally heavy floods of late 1997.

This disaster made the new plot holders more determined than ever to build an improved weir on the side of the river that would eventually bring water to their fields. By 1997, however, TIP had wound up its support in Msosa and was not willing to offer any more financial support. Still determined, the villagers reacted to this second setback by collecting funds for a temporary aqueduct and a new weir.

The village council and the WUA (which work together in Msosa) collected a total of 1.22 million Tsh. (\$1525) entirely from villagers. About 2200 shillings (\$2.60) was collected from each plot holder in the scheme, including the 500 new plot holders who had not yet been able to cultivate their farms. While this amount may seem modest, it was a heavy sacrifice on the part of the poorer villagers who had not yet even been able to cultivate their land. Overall, this highly impressive effort demonstrates the determination of those who had been granted land to complete the project.

The total amount collected from villagers in 1998 was not enough, however, to build the new weir. At this point, TANAPA (the Tanzania National Parks organization), which runs a game reserve near Msosa, offered to help with funding from its good neighbor fund. In the end, TANAPA contributed 2.4 million shillings (\$3000). For their part, the villagers, in addition to the money they had already contributed, mobilized an enormous amount of labor. Under the technical supervision of the local irrigation technician, the "second rehabilitation" was completed in less than a year. To us, this experience demonstrates that the distribution of land to the landless was a key factor in this highly impressive mobilization of villagers labor and funds for not one, but two rehabilitation projects.

III. PARTICIPATION IN REHABILITATION PROCESSES: COMPARISONS AND LESSONS

In the previous sections we traced the history and results of the rehabilitation processes. In this section we focus on a comparison on participation issues and draw out the lessons.

3.1 Mtandika: participation in planning and implementation

The Traditional Irrigation Improvement Programme (TIP), which supported the Mtandika and Msosa scheme rehabilitations, had a “step-by-step” approach that it used in all its projects.^{xxvii} This involved:

- Discussing the possibility of TIP assistance with the village council,
- Requiring a formal request for assistance from the village council
- Carrying out a feasibility survey,
- Working out the terms of a written agreement with village council and its water committee, and
- Signing a contract between TIP, the village council, and local government authorities.

3.1.1 Ensuring widespread participation in planning

Before entering into negotiations with villagers in the Iringa area, TIP made sure that district authorities, like the district executive director, and local technical officers, like irrigation officers, agricultural extension officers, and community development officers, were fully informed about TIP methods and activities. During the village negotiations and planning activities, district and local officers were invited to take part. This tri-partite participatory arrangement between the village, the district, and TIP gave the local authorities an interest in the success of the project.

The contract that set the terms and conditions of each party’s responsibilities in the rehabilitation was signed by three parties: the Village Council , TIP/SNV (SNV is the Dutch aid agency), and the District Council (represented in Mtandika’s case by the Ward Executive Officer).

The process TIP proposed to develop the contract provides a good model for participatory project planning. The TIP project manager and district staff (including the local irrigation technician, the district planning officer and the agricultural extension agent) worked with 14 villagers (7 men and 7 women) who had been elected as members of the ‘village planning and executive committee’ for the project. The task of this planning team was to work out the technical, financial, and implementation details of the contract.

TIP worked hard to make sure that women were involved in all planning and implementation activities. During our small group meetings with women leaders, they remembered how important TIP’s requirement that women attend meetings was to their own participation.

“TIP came with the condition that there be equal numbers of women and men in village meetings. If women didn’t show up, the meeting would be postponed.”

3.1.2 Setting conditions

Although TIP’s approach was highly participatory, it was not without conditions. TIP insisted on widespread participation in planning and implementing the rehabilitation. Furthermore, TIP would only provide support if villagers took responsibility for planning and organizing their own contributions of labor and, to a lesser degree, of money. Villagers’ own descriptions of planning processes provide a good picture of how this worked in practice:

“If the donor gives money, we also must give money. Therefore we had to have a bank account. We used our money from fines to open one.”

“The second condition was that we had to provide free labor.”

“The third was that we had to apply, and if our application was accepted, we would have to sign a contract.”

3.1.3 Participation in financial matters

One of the most important aspects of the contract was that all costs of the rehabilitation were set out in considerable detail. Each anticipated expense was attributed either to TIP, to the district government, or to the village council and its water committee. The Mtandika agreement said, for example, that villagers would provide 140 truckloads of stones and pay for 12 wire gabions. TIP would provide a supervisor, 75 gabions, and so forth.

Even more important was the way that villagers were involved in handling the money and the materials for the project. Technicians specified the types and amounts building materials that would be required, but villagers were in charge of the actual purchasing, storing, and record-keeping for these materials.

Villagers were also responsible for mobilizing and recording the labor contributions of villagers. Water distributors described how they scheduled self-help labor.

“Construction tasks required 22 farmers per day. We worked out the system of deciding who would come when and then we helped make sure that everyone turned out.”

3.1.4 Handling problems of non-participation

Even with all this preparation, however, soon after construction started, villagers failed to show up for work as planned. (This situation also occurred in Kikavu Chini). TIP’s contract with the village provided a means for dealing with this problem.

At first, only men had been expected to work on the construction of the new intake and main canal. The TIP agreement stipulated that if 80 percent of the planned group did not show up, the construction work would not take place. When the numbers of workers fell below this floor for several days in a row, TIP stopped the construction. The Ward Executive Officer then sued the leaders of the Village Government for breach of contract.^{xxviii} This caused an uproar, but it eventually led to a new approach.

A woman leader recalled,

“When men worked alone they failed to accomplish much, so TIP had us register ourselves again to work---this time women were included.”

Some men continued to resist the idea of women’s participation in construction, but this time, women were determined to take part.

“I was in a TIP leadership seminar along with the canal leaders and the founders of the system. These men told TIP it was bad to bring women to the canals because men were naked when they worked. We said we would buy them overalls.”

Other women also stressed women’s role in resolving the crisis.

“We held several meetings and finally made a plan to make sure that people would show up for construction work. Seven work supervisors were chosen: 4 women and 3 men.”

“The women in the village council forced the other women to participate.”

“Without our efforts the canal would not be there.”^{xxix}

The canal heads were in charge of mobilizing men.

“We had a system of fines for people who didn’t show up for work.”

“Landowners were told that if they failed to turn up, they could lose their plots.”

Tenants were also expected to participate in construction work.

“If you farmed there, you should work. Tenants accepted this. If you didn’t participate, even as a tenant, you were fined.”

A more positive motivation for tenants was the possibility of getting land. Although there was very little land for the WUA to distribute, people knew that if a person had not worked on the rehabilitation, he or she could not apply for it. The hope of getting land was also the reason that women were so adamant that they should participate in the rehabilitation.

“We also suffer from hunger, so we wanted to participate. After the rehabilitation, a few women were given some land in the forest.”

3.2 Kikavu Chini: participation in planning and implementation

Villagers’ participation in Kikavu Chini’s rehabilitation project was considerably more limited. This section focuses on understanding the reasons for the low participation and its effects.

The initial planning for the project in Kikavu Chini and its actual implementation were separated by several years. Villagers were first informed about plans for a new intake, a new main canal, and an extension of the scheme to irrigate an additional 400 acres in the Upareni sub-village in the late 1980s. This news fueled high hopes among the Upareni landowners. Tenants and laborers hoped that an expansion of the scheme would help them gain better access to irrigated land.^{xxx} These expectations stimulated relatively high participation in the early phases of construction, but over time, enthusiasm for the project declined. This section attempts to explain why.

3.2.1 The dangers of planning projects without local participation

In March 2000, a member of Kikavu Chini’s village council told our research team that from the late 1980s until construction actually began in 1994, “people didn’t know what was going on.” While this was something of an exaggeration, it is true that very few, if any, villagers were aware of the full scope of the actual design. This was very problematic because the rehabilitation made *major* changes in the traditional scheme.

Furthermore, the Kilimanjaro Zonal Irrigation Unit (KZIU), which was the implementing agency for the project, decided to follow the design for the rehabilitation that had been drawn up in the late 1980s even though it was certain at the time the construction began (1994) that there were not enough funds to complete it. Indeed, the KZIU itself told us that the UNDP funds for Kikavu Chini “ran out” even before the new weir was finished.

The decision to forge ahead without adequate funds was taken without informing the villagers. This created an enormous number of problems, including the many serious technical and environmental problems that we have already described in section two.

The fact that the scheme could not be completed in the way that most people expected (i.e. with a new canal for Upareni sub-village) was not understood by most villagers until after the scheme was formally turned over to the village in December 1998. This lack of transparency from the implementing agency generated tremendous resentment.

Several quotes collected during our research meetings sum up the villagers' feelings much better than we could. A young leader reported,

“We were not told how much money was planned for the project, so we could not give relevant advice.”

A still vigorous farmer in his late 70s added,

“We were simply told that the money was finished even though the project was not anywhere near completion. We were told that the shortage of money was due to inflation. I think, however, that these officials knew that the money would be short, but they accepted it because they expected to get a cut.”

There were many other criticisms of the manner in which the rehabilitation took place. A young landowner reported that during construction,

“The technical people didn't explain, didn't listen; they just told us what to do.”

Another added, “They didn't allow any villager to give advice.”

Several people questioned the competence of the designers and contractors, especially regarding the construction of the three kilometers of new main canal in an area prone to severe erosion. One water distributor observed,

“I have my doubts about how the new canal was constructed. I fear it won't last.”

An older water distributor with long experience at the scheme was even more cutting.

“I don't think all the money was spent properly. The engineering is bogus.”

This situation has caused not only frustration, but suspicion.

“When the contractor asked us to collect stones, maybe he didn't give us credit for the work we did. Perhaps he was paid for hiring people to collect stones and then just 'ate' the money”.

Men in a tenants meeting expressed the same thoughts.

“The village government was writing names of those providing free labor. Why did the contractor make a second list? It wasn't necessary. It may have been misused.”

Some people were willing to state their suspicions in great detail, although in doing so they claimed to be afraid for their safety.

“During excavation of the canal, the machine cost 40,000 shillings an hour. But it sat there and we did the excavation. Still they wrote down that the machine put in 12 hours. After that we refused to participate, and they called us thieves and drunkards.”

The last comment illustrates two important lessons:

- Villagers take a great interest in financial issues and are very aware of the potential for financial malfeasance in projects.
- The fruits of the financial suspicion are very likely to weaken farmers’ willingness to provide free labor to a project.

Problems of mistrust and suspicion were avoided in Mtandika because the villagers themselves kept the records on labor inputs and financial spending. This had an effect on people’s willingness to contribute free labor.

Even though Kikavu Chini’s rehabilitation needed a great deal more manual labor than Mtandika’s, our research survey confirmed that the amount of free labor contributed in Kikavu Chini was far less than in Mtandika. In Mtandika, men under 35 contributed an average of 115 days of labor for construction, but in Kikavu Chini men in this age group contributed only 73 days. Older men worked 93 days in Mtandika, but only 67 in KC. The same differences held for women: women over 35 worked 80 days in Mtandika, but only 43 in Kikavu Chini. Women under 35 worked 43 days in Mtandika, and only 3 days in K.C.

As a result of low participation in free labor, the Kilimanjaro Zonal Irrigation Unit (KZIU) had to hire laborers in order to finish essential tasks. This further depleted project funds, but since villagers had no idea about the amount of money available for the project, they did not necessarily understand that their refusal to work would compromise the completion of the rehabilitation.

When the current village chair asked why people in Kikavu Chini did not turn up for the work involved in closing the original intake, an older villager explained,

“We were boycotting because people had not been open with us or with the donor. How can you, as a government officer, accept money to do a project which you know you cannot finish?”

After the scheme was first opened on an experimental basis, erosion and flooding during the rainy season filled the new main canal with silt. According to the KZIU, this was one of the few times that people turned up to provide free labor. Most of these people were reportedly from Upareni. The KZIU said that they worked because “they wanted the new canal”.^{xxxix} This incident demonstrates that even in Kikavu Chini, people who thought that they would benefit from a project by getting better access to irrigated land were far more likely than others to contribute to the project. It is surprising, however, that the

KZIU continued to play on these false hopes when it had known for years that there was no funding for the Upareni canal.

3.2.2 How would participation in planning have changed the rehabilitation?

Many villagers commented that if they had been in charge of the project and had known that there was not enough money to complete the new design, they would have concentrated on dealing with the most pressing needs of the traditional scheme.

“Why did they build a whole new intake?”

“If I had been given a small amount of money, I would have planned a smaller, but complete job.”

One of the scheme’s founders summed up many people’s frustrations when he observed, *“The project was called ‘Rehabilitation of Traditional Irrigation’. Why didn’t they do that?”*

With hindsight it is easy to see that the failure to develop a viable irrigators’ organization and to involve its leaders in planning and decision-making for the project was a key mistake. Why this happened, however, is unclear.

Even though the KZIU had provided training for the leaders of the first irrigators’ cooperative formed during the project, but it did not involve them in project planning. The reasons for this seem to be related to the ignominious collapse of the *Ukuki* cooperative, and to the KZIU’s unwillingness to be open with the villagers about funding.

Villagers, for their part, are angry that they were not involved. One well-educated young man expressed the feelings of many when he stated,

“Even the leaders here don’t know how much the project cost. We were not involved in the tendering process or in budgeting. If we had had an organization at that time, we could have sat down with the donors and the government to plan, choose the contractor, and discuss financial issues and priorities.”

Some would say that this is too large a role for villagers. Our research in Mtandika suggests otherwise. Furthermore, it seems from Kikavu Chini’s experience that the results of bringing villagers into the financial and technical planning of rehabilitation plans could hardly be worse than the results of keeping them out.

3.2.3 An exception to low participation in Kikavu Chini: women’s groups

In 1994 the Women in Development specialist at the KZIU began working in Kikavu Chini. She formed 5-6 women’s groups of five members each. In addition to other activities, members of these groups established tree seedling nurseries and planted trees on canal banks in an effort to combat erosion. These efforts, while important, involved

only a very few people and therefore could not make much of a difference in stemming the enormous erosion challenges faced by the scheme. The gender expert's work might have had a greater impact had she provided gender training for government staff working in the village and assisted them in offering gender analysis seminars for irrigation projects in the village.

3.3 Lessons on participation in project design and implementation

Non-participation threatens sustainability

*You are the one who is responsible for all the food,
but someone else is cooking and you can't even go into the kitchen.*

This remark brilliantly captures the dilemma of villagers whose irrigation scheme is undergoing a conventional, top-down rehabilitation. They will have to try to sustain the results, but they are not allowed to try to prevent mistakes that can threaten the scheme's sustainability.

One of the main lessons of the research is that the failure to involve villagers in planning and implementing a rehabilitation process is likely to result in technical and social problems that can threaten both the physical and the social sustainability of the scheme. For example, because *Uwakichi* leaders at Kikavu Chini are constantly busy dealing with repairs to the new main canal as well as organizing weekly repairs of the huge breach in the traditional main canal, they have little energy or money to deal with the simpler problems that farmers expect them to solve, like building new division boxes to prevent water stealing. Villagers don't realize how much it costs to solve the new problems resulting from the rehabilitation; they only know that they paid their water fees and have not yet seen any results at the level of their own farms. Fearing that their money is being misused, farmers resist paying additional water fees. This is a clear threat to sustainability.

Uwakichi has inherited much of the suspicion and mistrust generated during the rehabilitation. We are not suggesting that such suspicions are warranted (in our opinion they are not), but we do think that if *Uwakichi* cannot account for the funds it has collected from farmers in a suitable manner, they will have increasing problems raising money for critical repairs. If these leaders give up or are voted out of office, the schemes' technical problems may well discourage others from volunteering to serve. In this scheme, a leadership vacuum, even for a short period, would increase the probability of a major technical breakdown.

Villagers should be involved in the technical and financial details of project planning and implementation

The Mtandika rehabilitation shows that a great deal of project planning, right down to the technical and financial details, can be planned and implemented in a participatory

fashion. A participatory approach to financial planning helps reduce suspicion and prevent the disastrous outcomes that can ensue if suspicions of financial malfeasance are justified.

Technical choices and their related costs should be discussed in detail with villagers. If technical discussions are carried out in small group meetings with different categories of farmers, design engineers will benefit from a wider range of local experience. If, in listening to many farmers, planners discover differences of opinion among groups, a larger meeting can use participatory ranking techniques to better reflect community priorities and opinions.

Participation will be more effective if women, youth, tenants, and laborers participate. Their views need to be fully represented.

Participation should extend to as many groups in a village as possible. Male landowners and village leaders are customarily included in project planning meetings, but efforts should also be made to reach out to women owners and to male and female tenants and laborers of various ages. To make participatory planning both inclusive and meaningful, village leaders and government staff should organize a series of meetings with small groups over a two or three day period preceding a village-wide planning meeting. Public announcements (both oral and written) about meetings for each category of farmer should be made a few days in advance. These small group meetings will help people prepare for the discussions and the decisions to be taken in full village meetings. If this process is begun early in the planning process and if everyone's opinions are taken seriously, most groups will be eager to participate.

Contracts are needed make all parties to the rehabilitation—donor, designers, technicians, contractors and villagers---accountable to one another. Contracts will be more effective if they are developed in a transparent, participatory manner.

The serious technical problems plaguing Kikavu Chini's irrigation scheme (a breached canal, breakdowns in new structures, severe environmental threats) after the rehabilitation was stopped for lack of further funding make the importance of open, detailed, and participatorily developed contracts very clear. Without a contract, villagers have no legal means of holding a contractor or design engineer liable for mistakes.

As Mtandika's experience illustrates, a contract can also be a means of holding villagers accountable for their responsibilities to provide free labor. A contract that is worked out in a participatory way will be more acceptable to villagers because it is likely to take account of their ideas about the technical and financial aspects of the scheme. The contract should also specify the villagers' commitments to provide labor and financial inputs for the scheme. Finally, the sanctions for any breach of the contract should be spelled out as well.

Participation is cost effective. It can save more money than it costs.

Why should projects invest the time and money (ex. for staff per diems) that a participatory approach to planning irrigation scheme rehabilitation projects requires? Because, as the as research has indicated, participation can bring greater financial benefits than it actually costs. Villagers' participation in planning can help engineers avoid design mistakes, thereby eliminating the costs of correcting them. Participation in planning also motivates people to provide both labor and financial inputs to the rehabilitation, thus reducing its overall cost. Participation creates an atmosphere in which fraud becomes difficult, increasing the likelihood that the project will be well implemented. Most importantly, participation prepares villagers to retain control and responsibility for their irrigation schemes, a critical element in sustainability.

IV. PARTICIPATION: DEVELOPING AN IRRIGATOR'S ORGANIZATION

4.1 The processes of forming irrigators' organizations in Mtandika and Kikavu Chini

Mtandika

In Mtandika both formal and on-the-job leadership training was integrated into the process of planning of the rehabilitation, the process of strengthening of the existing water committee, and the planning of an independent irrigators' organization. In other words, training was provided as villagers encountered the need for new skills.

In order to foster cooperation between the water committee and the village council, leaders of both groups were involved in the leadership training. After it was decided to develop an independent irrigators' organization, village council leaders remained involved in training and decision making related to the rehabilitation. Villagers said that this helped smooth the transition to an independent water users association (WUA).

Once the decision to form a new organization was taken, representatives of both the Cooperative Department and of the Ministry of Community Development (which assists with the formation of associations of various types) were invited to village meetings to discuss the pros and cons of each type of organization.

During our research discussions, villagers referred to the planning and training meetings that both preceded and accompanied the rehabilitation as "TIP seminars", a word that captures the participatory flavor of the way they were conducted. TIP encouraged district and ward officers to participate in these seminars, especially the local irrigation technician, the agricultural extension agent and the community development officer. This helped the technicians prepare themselves to provide follow-up assistance and further training.

To stimulate women's participation in leadership and planning, TIP provided a salary bonus and working funds for the local agricultural extension agent that allowed her to

undertake a gender training program. Local government officers, including irrigation technicians and engineers, were also involved in gender training so that they could learn how to help both men and women deal with problems affecting the scheme.

Gender training focused on teaching both men and women how to analyze male and female economic and political roles, thereby setting the stage for working together to find ways to improve women's participation in the irrigators' organization. Gender training seminars were successful in convincing men to allow women to participate in the management of the WUA.

Kikavu Chini

During the rehabilitation of Kikavu Chini's irrigation scheme, the Kilimanjaro Zonal Irrigation Unit (KZIU) made two attempts to form an organization to run the scheme. The first failed, but the second succeeded in forming the current organization, *Uwakichi*.

Following the formation of the first cooperative, the KZIU sponsored a five-day training course for its leaders. The course was planned and implemented by officers from the Irrigation Section in Dar es Salaam with the collaboration of the regional cooperative officer and agricultural officer. The course content was appropriate to the leaders' needs, but it lost some of its potential impact because the leaders who were trained were not involved in any of the major technical or financial decisions associated with the planning and implementation of the rehabilitation itself. Furthermore, the new leaders of the current irrigators' cooperative have not been trained.

The KZIU requested the Cooperative Department of the Ministry of Agriculture to assist in forming both of the cooperatives created during the rehabilitation project. For the process of forming the current irrigators' cooperative, the Village Council appointed an "interim committee" of villagers to work with the regional cooperative officer. Members of this committee reported that they focused on developing a standard cooperative. There was little discussion of the special needs of an irrigators' organization. Advice was given in a somewhat top-down and legalistic manner. Some members of the village "interim committee" were not even involved in the writing of the constitution or by-laws. The constitution forced *Uwakichi* to undertake several expensive marketing activities of questionable importance to good management of an irrigation scheme.

Local government officers, like the local agricultural extension agent, irrigation technician, and community development officer were not involved in the formation of Kikavu Chini's irrigators' cooperative. This has prevented them from providing the follow-up assistance that the *Uwakichi* leaders clearly need. The villagers say that they do not know how to contact the cooperative officer.

4.2 Cooperative or Association? Organizational Issues for Irrigators' Groups

Organizational problems are burning issues for the irrigators' organization in Kikavu Chini. During the research workshop, the presentations from Kikavu Chini villagers

sparked heated and prolonged discussions. As a result of these discussions, workshop participants strongly recommended that before any organizational form is chosen, representatives from the Department of Cooperatives and the Ministry of Community Development should both meet with traditional water committees to discuss the pros and cons of each organizational type.

Kikavu Chini's irrigators' organization, *Uwakichi*, was formed as a cooperative. Mtandika's was formed as an association or WUA. In order to become a cooperative, Kikavu Chini irrigators had to hire a manager, open an office, pay to register the cooperative, pay for periodic audits from the Department of Cooperatives, open a shop to sell agricultural inputs and market the agricultural output of members. We argue that these marketing functions are not central to the objectives and tasks of an irrigators' organization. An irrigators' organization, especially a newly formed irrigators' organization, needs to focus on the appropriate management and maintenance of the scheme. To worry about marketing before the scheme is operating smoothly is to distract the leadership from its most important functions.

The level of discontent with the cooperative form of organization in Kikavu Chini is very high. During the research workshop, an *Uwakichi* leader expressed the general dismay of both leaders and members.

“We were not told about the difference between an association and a cooperative before we were told how we had to form our irrigators' organization. Before Uwakichi was formed, the village government took care of all matters related to the scheme and there was not much trouble, but since Uwakichi the situation has started to get out of control.”

The formation of an association puts no specific requirements on irrigators in terms of marketing, hiring a manager, or other functions that the association must pay for. The only cost is the legal registration of the organization. In Mtandika, the village government and its water committee both agreed that it would be best to form an association after they had been informed about the pros and cons of both associations and cooperatives. They have had no reason to regret this choice.

4.3 Membership issues in irrigators' organizations

Kikavu Chini's irrigators' cooperative, *Uwakichi*, has had a great deal of trouble attracting members: only 78 of the 350 landowners in the scheme are members. In contrast, Mtandika's WUA has 300 members, including nearly all the landowners and many of the tenants in the scheme. There are several reasons for these differences.

First, membership in *Uwakichi* is limited to landowners. The exclusion of tenants is not related to the organization's registration as a cooperative. It seems to be a result of the social tensions between elders and youth and owners and tenants. It also reflects the fact

that when the constitution was being written, very few farmers realized that the interim committee had decided to restrict membership to landowners.

A second reason for the difference in membership in the two villages is the fact that the first cooperative organization formed in Kikavu Chini failed due to financial improprieties. People are inevitably affected by this history; they don't want to risk losing their membership fees if *Uwakichi* should also fail.

The third and perhaps more important reason for the difference is that a certain measure of force was used to compel people to join the Mtandika WUA. A farmer had to join to get water.

Our research indicates that there are risks associated with the use of force to get people to join an organization. People who feel that they have been forced to join are less inclined to cooperate fully with the leaders of the organization. They may resist paying for scheme improvements, as exemplified by the difficulties Mtandika WUA leaders have had raising money to repair the sand trap door. Worse yet, they may look for ways to get around rules they don't like rather than attempt to get them changed. The research found that some farmers pay water distributors to close their eyes infractions of the scheme's by-laws, thereby corrupting the leadership itself.

There are also risks to arbitrarily keeping some farmers out of an irrigators' organization. If people feel that they have no one to listen to their problems and no way to work together with the leaders of the irrigation scheme, they too will be less inclined to cooperate in the proper operation and maintenance of the scheme.

4.4 A major problem of irrigators' organizations: managing money

The greatest threats of all to the effectiveness and sustainability of an irrigators' organization are posed by financial problems. No matter what the form of the organization, the research found that all irrigation leaders lacked adequate training in financial management. They also seem to have nowhere to turn for support.

The research found that leaders' failure to provide farmers with regular information on financial matters creates problems even when financial management is good. When farmers are not told how the annual water fees they pay are being used, they become reluctant to pay additional money for scheme repairs or improvements. If farmers are not informed about all the expenses of the irrigators' organization, they become suspicious of requests for more money or of leaders attempts to raise the water fees.

In both Mtandika and Kikavu Chini, executive committee members cannot provide the kind of convincing arguments farmers need to part with the little money they have in order to obtain a collective benefit. In both cases farmers fear that their money may not, in fact, be turned into a collective benefit but might simply go to someone's personal benefit. This is the heavy hand of history. It affects the cooperatives more than the associations, but it is surely not limited to the cooperatives.

We think that these types of problems are very common and require a special effort on the part of the Irrigation Section and Ministry of Water to develop a financial management training program for all district officers who work with irrigators' organizations. This training program needs to be prepared using a participatory training needs analysis to investigate how different irrigators' cooperatives and WUAs are currently handling money and what their problems are.

4.5 Lessons on developing an irrigators' organization

Strengthening of the irrigators' organization should be the first priority of a rehabilitation project

Irrigators' organizations and village councils need to be involved in the planning and implementation of rehabilitation projects from the very beginning of those projects. This will often require training to strengthen the existing irrigators' organization so that its leaders can participate more effectively in planning and implementation activities. It may also be necessary to encourage the organization to broaden its leadership so that women and younger farmers and tenants are represented.

Participation in the planning of a new irrigators' organization should be inclusive and democratic

The issue of "who" should participate in strengthening or re-forming an irrigators' organization cannot be properly addressed simply by working with the current leadership in a village. Participants should include all categories of farmers as well as local government and district authorities. Farmers, village council members, water distributors, water committees, and technicians from local government should come together on an equal footing with the funding and technical assistance agencies.

Because villagers will inevitably have to manage the irrigation scheme, they must be deeply involved both in planning the rehabilitation and in planning for the development of the irrigator's organization. Villagers must also participate the planning of training, which should begin with a participatory training needs analysis.

Special efforts are needed to ensure the participation of women and youth

Special efforts should be planned and funded to bring women's and younger men's voices into these planning processes. The marginalization of women and youth from village politics, decision-making, and land control are very common. TIP's promotion of gender training for both men and women and the fact that TIP assistance required a certain gender balance for both organizational development and project planning led to far greater gender equity than would otherwise have been the case. The work of the KZIU gender specialist with women's groups in Kikavu Chini was also helpful to

women, but it did not provide a forum in which men and women could confront gender issues related to irrigation together.

Neither TIP nor the KZIU made any special efforts to ensure the participation of youth. It is possible, however, to adapt gender training methods such as the analysis of the social division of labor, access to resources, and involvement in decision-making to the issues of differences based on age and socio-economic status. We therefore recommend that gender training be broadened to include an analysis of the situation of youth and of the landless in an effort to ensure wider participation and greater equity in irrigation rehabilitation projects.

Small group preparation meetings can help ensure participation of all segments of the community

All interested persons should be allowed to attend the planning meetings to form an irrigators' organization and to write its constitution and by-laws. To reduce the size of the actual planning meetings while still ensuring participation by all segments of the community, smaller meetings for different groups, like male and female owners, tenants, laborers, and youth should be organized first. During these small group meetings, each group should become familiar with the basic organizational issues and asked to choose representatives to attend the general planning meetings. This attention to inclusiveness will contribute to the legitimacy of decisions taken in the planning meetings and to the confidence people have in the leadership. This, in turn, will lead to greater cooperation between farmers and leaders.

District staff should inform villagers about the practical and legal differences between cooperatives and associations.

Village councils and irrigation scheme leaders need to be well informed about the differences in the ways cooperatives and associations work, both in practical terms and in legal terms. In order to inform villagers about the pros and cons of choosing each type of organizational structure for their irrigators' association, district governments must provide both cooperative officers and community development officers with the means to attend a series of village seminars in which organizational issues are discussed, organizational forms chosen, and constitutions and by-laws developed. These meetings should be open to all interested parties.

V. TRAINING

5.1 Training for leaders

Both TIP and the KZIU sponsored training for leaders. In TIP's case, the training was offered jointly to the village council and its water committee. TIP sponsored training was often conducted during participatory seminars whose major objective was to plan the rehabilitation of the scheme. The TIP manager often involved local government staff like

the agricultural extension officer, irrigation technician, or community development officer in these seminars. As a result, when more formal leadership training was organized, village leaders already had an understanding of the kinds of challenges the training would help them confront.

The Kilimanjaro Zonal Irrigation Unit sponsored a five-day leadership training course for 10 women and 10 men in late 1997. The training was conducted by an Irrigation Section sociologist, an agricultural officer, and a cooperative officer. It covered principles of leadership, the development of an irrigators' organization, and bookkeeping. The training took place before the current irrigators' organization was formed so only half of the trainees are still in leadership positions. It has not been followed up for the current leaders.

In both villages, leaders of the irrigators' organizations emphasized that they need more training, especially in financial planning and record keeping. One Mtandika leader said, "We got a lot of training. The hardest was financial; some parts we didn't understand." The research team agrees with this assessment. The research indicated that a lack of knowledge about how to budget for the irrigators' organization, handle its money, keep financial records, and report on financial issues to members and other farmers is seriously undermining the leaders' credibility and their ability to raise funds.

Both TIP and the KZIU concentrated most of the training they sponsored on leaders. In both cases this created strong perceptions of unfairness. Charges of favoritism and unfairness were frequent and often bitter with respect to way people were chosen to go on trips to visit other irrigation schemes. Both the KZIU and TIP sponsored study tours within Tanzania. The KZIU also took village leaders and KZIU staff on trips to Egypt and Zimbabwe. The foreign trips had particularly problematic aftermaths. Farmers showed their anger at perceived favoritism in the choice of villagers invited to take part in these trips by refusing to attend the post-trip training sessions the participants organized upon their return. This reaction greatly reduced the value of the trips for the village as a whole.

5.2 A Critical Need: Financial Management Training

As emphasized earlier, leaders in both Mtandika and Kikavu Chini do not have adequate skills in financial planning, financial management, or financial reporting. This is a critical deficiency in their skills. All members of the executive committee of the irrigators' organization need to be able to thoroughly understand and communicate openly and effectively about financial issues. To master these skills, villagers need both training and continuing support.

Given the importance of transparent financial management to the success of irrigators' organizations and to the sustainability of irrigation schemes, we strongly recommend that the Irrigation Section collaborate with the River Basin Offices, the Ministry of Community Development, and the Department of Cooperatives to develop a financial

management training course for district and ward officers who would in turn train and support to villagers.

The course should include:

- Expenditure planning for
 - Regular expenses of the organization, like payments for water distributors, WUA executives, and so forth
 - Special expenses of the organization for repairs or special projects
 - Fees that have to be paid to the government, like the annual water fee

- Income planning to
 - Set the annual water fee for farmers
 - Estimate income from fines

- Methods for participatory budgeting to
 - Learn how to communicate with farmers about financial issues
 - Better understand farmers' priorities for spending
 - Convince farmers that certain types of spending are needed

- Methods for simple bookkeeping

- Methods for conducting periodic financial audits to
 - Prevent misuse of funds
 - Report on financial matters to all who pay water fees

5.3 Training for water distributors and conservation specialists

Both the KZIU and TIP trained water distributors in soil and water management. In Kikavu Chini several canal heads reported that this was the most important training they had received, but “it was too brief”. The KZIU also trained two water distributors and a male farmer as village technicians. These farmers learned how to measure the slopes of canals and to undertake simple engineering projects to improve water flows. Since the training they have been able to improve the efficiency of water use in several ways.

The KZIU also trained 20 people on how to combat gullies by building cut off drains and structures intended to halt gully formation. Unfortunately, the erosion problem in Kikavu is too severe to be much affected by locally built anti-erosion structures. The first heavy rains destroyed both the villagers' work and their will to try again.

In Mtandika, the TIP-sponsored training for water distributors included seminars on water management, water distribution, and canal maintenance. According to farmers' analyses of water distribution problems before and after TIP, the training was both appropriate and well accepted.

One problematic issue with water distribution does remain, however, in both Mtandika and Kikavu Chini. This is the issue of allocating water to women farmers at night. In Kikavu Chini women reported problems with physical assault when they have to their fields at night. In Mtandika and Msosa women complained that male farmers are aggressively stealing their water when it is allocated at night. In both cases, male water distributors assert that women's complaints do not warrant changing their schedules. This is clearly an issue that needs more discussion.^{xxxii}

5.4 Training for farmers

In Mtandika, training in agriculture, conservation, and scheme maintenance was offered to two farmers per canal. Trainees were elected by other farmers on their canal. The agricultural training focused on how to level and prepare plots, space crops, use improved seeds, prevent erosion and maintain the canals. Farmers considered this training important and helpful, but they complained that it was too short.

The TIP training program worked closely with the agricultural extension agents and irrigation technicians assigned to the villages. Farmers in Mtandika said that during the rehabilitation project, they learned how to work with these government officers more effectively. In Kikavu Chini, the KZIU did not work with the local agricultural extension agent, whom we considered very well informed about crop and land ownership issues in the irrigation scheme. We were not able to determine the reason for this situation.

In Kikavu Chini, the KZIU expected the leaders taken on study tours to other irrigation schemes to provide training for other farmers. As mentioned, this did not work well. On the other hand, the research team learned from our survey that farmers who had taken intensive agricultural training courses at the Moshi College of Agriculture had managed to train two to five other farmers each.^{xxxiii}

The survey also found that more than 90 percent of respondents want more training in agriculture. Farmers are particularly interested in training in the proper use of fertilizers and pesticides and in methods to increase the efficiency of water use through field leveling and crop spacing.

5.5 Gender Training

The approaches taken to include women in scheme rehabilitation and organizational development activities were different in Kikavu Chini and Mtandika. The KZIU sent one of its own staff members, an extension and gender specialist, to form and support women's groups in Kikavu Chini. Since 1994, she has formed six groups of five members each.^{xxxiv} These groups planted trees to protect embankments of the irrigation canals and have engaged in agricultural and income generating projects. Many of the women leaders in the village are members of these groups. While the formation of women's groups has been a useful approach to promoting women's political and

economic activism, forming and supporting these groups herself may not be the most effective use of the gender specialist's time.

In Mtandika and Msosa, TIP trained and supported a female agricultural extension agent who tried to encourage all women to participate in the rehabilitation project. Because women in Mtandika faced greater gender-based constraints on their participation in public life than women in Kikavu Chini, this work had to begin by talking with women in their own homes. The TIP program also assisted the extension agent in planning and conducting gender training seminars for both men and women. These seminars were aimed at getting men to understand the problems associated with constraints on women's social and economic participation and to allow women to participate in the planning and implementation of the rehabilitation project. As discussed earlier, women and men both reported that TIP's 'gender seminars' made a big difference in women's participation.

TIP's approach to gender training was focused on the whole community, while the Kilimanjaro Zonal Irrigation Unit used a more traditional approach of forming women's groups. The women's group based approach reached fewer people and didn't engage men in discussions about gender issues. TIP's approach trained local government officers and supported them in carrying out gender training. This training of trainers approach has the potential to spread skills in gender analysis more broadly, although gender training for villagers cannot be replicated unless the district council provides training funds.

5.6 Lessons on training

Training should be integrated into participatory planning processes

The research found that leadership training was most effective when both trainees and trainers were collaborating to solve problems that village leaders are actually facing, i.e. when it was integrated into actual planning and project implementation processes. When the training was truly collaborative (rather than top-down) the trainers simply brought their experiences from other situations for consideration, and the trainees discussed which approaches and methods were most suitable to their own situations.

Training for leaders in financial planning and financial management is critical

As we have already emphasized, it is essential to offer training in financial planning and management. This training should be comprehensive, but not offered all at one time. Financial training is best if it is spread over the period in which the leaders are learning about the practical problems of managing an irrigation scheme. It should focus on the kind of simple financial analyses that most people can understand easily and that villagers need to maintain confidence in their leaders. It should continually stress the need for accountability to all villagers.

Gender training is effective in increasing women's participation in irrigation projects. Gender analysis tools can be adapted for training in social difference analysis, which can similarly increase the participation of youth and landless farmers in project planning and implementation.

The Irrigation Section should develop a cost effective approach to gender training by using its staff to train and support agricultural extension agents, irrigation technicians, and community development officers to better understand the gender issues associated with irrigation projects.

The Section's gender specialists and sociologists should develop a gender and socio-economic difference training program focused on youth and landless tenants and laborers. This can be done by adapting TIP's tools for gender analysis for the analysis of issues that marginalize younger people and landless farmers.^{xxxv} This training should be developed as a training of trainers program for district staff. Externally funded projects and district councils should then support the trained district staff in conducting training in the villages where irrigation rehabilitation projects are being undertaken.

Agricultural training is a strongly felt need among irrigating farmers. Participatory methods should be used to do a training-needs assessment and to choose trainees.

The research showed that the biggest problem with agricultural (and other) training seems to be that everyone wants it, but few get it. In Kikavu Chini, 22 percent of farmers were trained and in Mtandika 26 percent. This includes those trained by other farmers.

The "training of trainers" approach is can reduce costs, but it must be well organized to be effective. In both Kikavu Chini and Mtandika, we saw that the training of trainers does not work well if other farmers are jealous of those chosen as trainers, a situation that is more common when scheme leaders are chosen for almost all the training offered. One leader in Mtandika provided a thoughtful solution to this problem. Projects should train leaders only in those areas in which they require training *as leaders*. Other types of training, like agricultural and conservation training, should be spread as widely as possible.

During agricultural training, many different groups of farmers should be trained. Each person should be thoroughly trained on only one or two topics so that the trainee will have the skills to train others. Other farmers should be trained on other topics. One way to organize this is to ask farmers on each canal to nominate one farmer for each topic of the training. Then train each group very thoroughly on the topic and also train them on how to teach others about this topic. This way each trainee learns both the subject matter and how to teach it.

A training of trainers approach works best if the farmers themselves choose those who will be trained. If the selection process is open and democratic, farmers will select those farmers who will be able to pass on the training. The same principle holds for the

training of water distributors. If farmers have not chosen their water distributors or leaders, training these people will not necessarily give them the legitimacy they need to successfully train others.

Efforts should be made to train representatives of all social groups. Farmers should be encouraged (but not forced) to elect women and younger men as well as older male farmers for training. Rough guidelines for representation should be discussed in a village meeting before people are actually chosen for training.

All farmers should have a chance to suggest what they see as their priority training needs. Farmers' priorities can be discussed and ranked in a village wide meeting. At this meeting the resources available for training should be clearly explained. Farmers should also discuss the training of trainers approach to that everyone knows what is expected of the trainees.

Villager leaders need links to district government for continuing training and support

The project coordinator for the Smallholder Irrigation Improvement Component of a World Bank financed project engaged in rehabilitating traditional irrigation schemes told the research workshop that one of the main lessons of his project is:

There is a need for continuous capacity building of farmers' associations and cooperatives.^{xxvi}

Our research reached the same conclusion. We found that village leaders in all the research sites need additional support. There is some difference, however, in how the projects have provided leaders with information on how to seek support.

In Mtandika many local government officers and technicians have been involved in the development of the water users association and in the planning and implementation of the rehabilitation of their irrigation scheme. This gives Mtandika leaders and farmers a fairly large group of people to turn to for advice and support. In Kikavu Chini leaders are far less aware of who might appropriately help them deal with the various problems they face, in part because they have been quite dependent on a single agency, the Kilimanjaro Zonal Irrigation Unit. But since the KZIU will eventually need to focus on new projects, it may not always be in a position to help.

Unfortunately, district governments may also not always be able to help. District officers can have the skills to train and support the leaders of irrigation organizations, but unless they have access to project funds, they often don't have the resources to provide training or follow up support. During the workshop sponsored by this research project, many participants emphasized the importance of putting aside district funds that can be used to supplement and build on training conducted by projects. This is a critical issue requiring support from policy makers. Projects end, but if irrigation schemes are to be sustainable, training and support must continue.

VI. FOSTERING PARTICIPATION, EQUITY, AND SUSTAINABILITY: LAND DISTRIBUTION IN MSOSA VILLAGE

In section two of this report, we described the effects that Msosa's distribution of irrigated land to landless villagers had on people's determination to complete the rehabilitation of their scheme. In this section we focus on how and why the Msosa village council and WUA succeeded in distributing irrigated plots to landless men and women and to married women whose husbands already had land.

6.1 Why and how did the village council distribute irrigated plots to the landless?

In 1989, when TIP first came to Msosa, land ownership was heavily concentrated among the 10-12 founders of the scheme. The largest owner had 38 acres. There were also at least 150 landless people farming as tenants. Most of the landless were farmers who had been forcibly resettled from Mbatwa in 1977.^{xxxvii}

Seeing the possibility that the rehabilitation project could expand the scheme's command area, TIP and the village council explored the possibilities for distributing plots to the landless. The village council had previously lent out small parcels for rain-fed farming in the area where the scheme was to be expanded, but most of the area had never been cultivated or even cleared. The village council, anticipating the distribution, formally announced that all "undeveloped" land in the village belonged to the village council and could therefore be officially distributed. Sometime later the right of the village council to distribute this land was upheld in court.

Next a survey was done to determine approximately how much land was likely to be irrigated. Finally, landless people were invited to apply for plots. Soon thereafter, a public meeting was called to verify that none of the applicants already owned irrigated land. If an individual was known to have a plot, or if his father had a large amount of land, his or her name was removed from the list of eligible applicants. If a woman had received land from her father, she was not eligible. Married women, however, could apply even though their husbands owned land, because traditionally a woman cannot farm her husband's land on her own account.

Once the applicant list was completed and verified, individual plots were distributed by lottery. Landless men got the same sized plots as women who headed their own households—a third of an acre. Married women received a quarter acre. The area to be distributed was divided into women's and men's sections. The grouping of women's plots in one section was designed to allow women to elect their own water distributor. The women's section was located adjacent to the original scheme, thereby assuring that women would get water first.

6.2 Why did women get priority access to land?

It was argued that women should have priority in land distribution for three reasons:

1. Most women headed households with children were landless.
2. Married women who did not have their own plots had few means for earning an income.
3. Women had participated in the rehabilitation of the scheme and should therefore benefit.

The leaders of both the village council and the WUA agreed. Interestingly, most men also approved. (We found this surprising given the highly patriarchal reputation of the Wasagara people.)

An older, formerly landless man commented,

“From the beginning women were told that they had to contribute. We even saw that if women were cooking for the laborers, they were contributing and should therefore get land.”

The more powerful male elders also went along with the distribution.

“How could be refuse? New land was given to people from here. There was no redistribution of formerly irrigated land.”^{xxxviii}

The last quote clearly suggests that it would have been much harder to gain the support of the powerful founders of the scheme for a redistribution of large irrigated plots than it was for the distribution of formerly rainfed land.

An interview with younger men who had received land in the distribution (albeit land than has not yet gotten water because it is beyond the women’s fields) also approved of the distribution of plots to women.

“We like what happened with women. We felt that it is good for women to be equal. Before they had been very oppressed.”

A younger man pointed out that,

“Women are contributing what they get to the family.”

And a single man added,

“Even me, I can marry a woman who has a farm.”^{xxxix}

While we could not ascertain whether these positive attitudes simply reflected the gender training these men were exposed to, or if they represent a significant cultural change, we

do know that it is still too early to know how sustainable the distribution of land to women will actually be. Two factors may create problems in future:

- The fact that the water has not yet reached the men's fields and may, according to the irrigation technician who surveyed the area, never reach all of the men's plots could prompt landless husbands to take over their wives' fields.
- The fact that women have been persuaded to allow their husbands to do the initial clearing of their plots and to cultivate them for the first season, presumably because the clearing work is "too heavy for women", could give men a traditional claim to these women's plots.

Our discussions with women who had received land revealed that they too have anxieties about their ability to keep their land and their crops under their own control. Women realize that since men are helping them clear their new fields, men may claim the harvest. Since men often sell crops for their wives (it is definitely *not* the custom in this area for women to sell their own crops), women fear that even after women themselves grow the crops, men may keep their profits. Consolidating women's new advantages will not necessarily be easy. Further observation will be needed to ascertain women's actual benefits over time.

Potential problems aside, it is important to recognize that the allocation of plots to married women in their own right is precedent setting, not only in this highly patriarchal culture, but in Tanzania as a whole. The acquisition of formal ownership rights from the village council is a particularly important achievement, because it implies that women have full rights of ownership. When husbands give their wives plots, divorce or widowhood essentially ends women's 'ownership'. When a woman receives land from her father, it can be claimed by her brothers. In contrast, because the women of Msosa have been allocated land by the village council, they expect that they will be able to keep it even if they are widowed or divorced. And when they die, they expect to pass it on to their own heirs.^{x1} These are indeed revolutionary expectations.

We have described Msosa's experience with land distribution in detail in order to demonstrate that irrigation projects can play a unique and important part in opening up women's access to land. This is likely to improve the prospects for the scheme's economic success and sustainability. It will also contribute to poverty alleviation.

6.3 Problems with the Msosa land distribution

Although the great majority of villagers approved of the distribution of irrigated plots to the landless, the process did not take place without problems. Some young men, for example, complained that their applications were denied because people did not understand that they were not farming their own land. These cases were few and may be

resolved when (and if) water reaches the far tail end of the scheme. There was also, however, one case of long and bitter opposition that has not yet been fully resolved.

One man has obstinately refused to give up his claim to plots in the women's area. He has taken the village government and TIP to court, winning at first and then losing on appeal. Undeterred, he continues to use intimidation and threats of witchcraft against women who have been allocated land he claims. Some villagers reported that this lone dissenter has forcibly taken land from 20 women. One of his victims said that the aggressor's brother is now farming her land. Village leaders continue to pressure the troublemaker to give back the land he has taken, some villagers noted that his ferociousness has frightened nearly everyone and has blunted the village's efforts to stop him. Most people are still optimistic, however, that eventually, he will be forced to give up the land he has illegally occupied.

6.4 Lessons from Msosa's land distribution

Participation increases the potential for cost recovery, especially if a project's benefits are widely distributed

Of all the three experiences with irrigation scheme rehabilitation, Msosa's had by far the most successful mobilization of village labor *and money* in support of the rehabilitation process. We think that this success is primarily due to the fact that Msosa was able to distribute land to a large number of landless people. This gave the overwhelming majority of the population a large stake in the success of the rehabilitation. As a result, all households contributed what were for them significant amounts of money, even before they were able to farm the land they had been allocated. People also contributed a great deal of free labor to both rehabilitations, i.e. the one TIP sponsored and the one they themselves were determined to finish after the El Nino floods of 1997 destroyed the aqueduct TIP had helped them build.

While even the second rehabilitation would not have been possible without some external support, we are convinced that because the villagers were so motivated and had contributed as much money and labor as they possibly could, the external subsidy to the second Msosa rehabilitation was much lower than most subsidies accorded to comparable projects.

VII. COSTS AND BENEFITS OF THE REHABILITATION FOR DIFFERENT GROUPS OF FARMERS

7.1 Distribution of costs and benefits by class: landowners, tenants, labourers

7.1.1 Landowners' benefits

In all the cases studied, landowners were the major beneficiaries of rehabilitation projects. The increase in the value of their land has usually been realized through an increase in rental prices. Rents have risen more than 20 percent (in real terms) in Kikavu Chini.^{xii} Landowners in all villages studied can also demand payment several months prior to the season for which the rental contract is made.

In the Landi sub-village of Kikavu Chini, where the building of the new main canal made it possible to irrigate 100 acres of previously rain-fed land, one owner recently sold two acres of land suitable for growing maize and beans for 1,600,000 shillings, \$1000 per acre.^{xiii} Like many of the large landowners in this area, the owner lives in Moshi town, not in the village.

7.1.2 Landowners' costs

Owners apparently paid no greater share of the labor and financial costs of the rehabilitation than other groups. Tenants were expected to put in as much free labor as owners. The research survey data show that in both Mtandika and Kikavu Chini younger men actually paid more money toward the rehabilitation than men over 35 years of age, even though the young are far less likely to be landowners than are older men.

Ironically, the Landi landowners, who realized the greatest benefits in Kikavu Chini, did not even participate in the construction of the new canal that has enriched them, reportedly because the original design did not show that their fields would be irrigated. Furthermore, because it is now technically difficult to cut off their water, many are said to be lagging behind in paying their water fees (*Uwakichi* informant).^{xiii} Finally none of the owners from this area participate in the weekly community labor to repair the breach in the traditional main canal, because the problem does not affect them.^{xiv} In short, the Landi landowners contributed little to the costs of the scheme, but amassed the great bulk of the benefits.

7.1.3 Tenants benefits

After the rehabilitation, tenants in both Kikavu Chini and Mtandika benefited from a more reliable supply of water to their fields. This significantly reduced their risk of crop losses. Tenants considered this the greatest benefit they received. The improvement in water supplies was especially significant in Mtandika. Before the rehabilitation tenants could normally only irrigate half their fields, now they usually irrigate the whole field. Another benefit of importance to tenants was the solution to the problem of sand inundation in Mtandika. Finally, tenants in both villages also benefited from some training in agriculture.

7.1.4 Tenants costs

In Mtandika, less than 10 percent of farmers are tenants. In Kikavu Chini, 57 percent of farmers rent land. Some of the renters in Kikavu Chini also own small plots of irrigated land, but 30 percent of farmers on the scheme are landless tenants. This means that any

deterioration in the situation of tenants will be far more broadly felt in Kikavu Chini than in Mtandika.

The research survey provided evidence that tenants are paying higher rents since the rehabilitation. In Kikavu Chini, for example, the real cost of renting an acre of irrigated land suitable for growing maize and beans has risen from 2.3 bags of maize in 1997 to 2.8 bags in 1999, an increase of almost 22 percent. The cost of renting rice plots has risen even more.

Rental conditions are also becoming more difficult. Previously rent was paid when the tenant took over the land. Today tenants must pay for the following season before they can sell their harvest. This is a serious hardship for people whose main source of cash income is farming.

In both Kikavu Chini and Mtandika, landowners are able to raise rents and demand earlier payment due to increasing competition for irrigated land. In Kikavu Chini, urban-based tenants from Moshi are increasingly offering terms that landless farmers born and bred in the village find very difficult to match. Several Kikavu Chini tenants said that since the rehabilitation they are increasingly fearful of losing access to the plots they have rented for many years.

In Mtandika, the water users association tried to discourage landowners from renting out plots by requiring those who do to pay special fees. The rationale was that since owners received their land free-of-charge from the village council, they should be discouraged from renting it to others. This policy, which was intended as a means of increasing equity, is ineffective. The fees are easily passed on to the tenant, so the actual effect is to increase the tenant's costs.

In Kikavu Chini, tenants are excluded from the irrigators' cooperative by an article in its constitution.^{xlv} This seriously limits *Uwakichi's* membership because nearly a third of Kikavu Chini's farmers are landless tenants. Many tenants, especially those who were born in the village, have strongly decried the unfairness of their exclusion, pointing out that they provided labor for the rehabilitation and are expected to pay water fees and provide labor for scheme maintenance.

The research team asked the *Uwakichi* leadership why tenants are barred from membership. Many answers asserted that tenants are "instable" and "lack commitment" to the scheme. Since most tenants are villagers, these comments seem unsubstantiated. They can perhaps be best understood as reflecting the social and political tensions in the village and, in some cases, personal hostility between some tenants and some *Uwakichi* leaders. These tensions cast a shadow over the prospects for effective management of the scheme.

7.1.5 Laborers' benefits

In both villages studied, about 15 percent of people farming in the irrigation schemes are working as laborers. Many of these people combine agricultural wage labor with other work.

The research survey indicates that laborers' wages in Mtandika have doubled over the past five years. If we adjust for inflation, the increase in real wages would be on the order of 25 percent. In Kikavu Chini there seems to have been little or no change in wage rates since the rehabilitation. One reason for the difference between the two villages is that the supply of laborers in Kikavu Chini is much larger than in Mtandika. Kikavu Chini is located adjacent to a huge commercial sugar plantation that attracts labor from all over Tanzania. Mtandika's labor supply depends almost entirely on people living in the village.

In Mtandika many laborers are women whose husbands are landowners. Married women work for wages because most men don't share the income from onions with their wives. Divorced women without land also work as laborers. Women account for just over half of all farmers in Mtandika's irrigation scheme. Twenty one percent of them work as paid laborers.

On both schemes many laborers are young men. Some of these male laborers also farm a small plot on their father's land. In such cases the laborer's basic subsistence is covered by his work on family land. Other laborers, especially those from outside the village, depend entirely on their earnings for both food and shelter. Their economic situation is far more difficult.

7.1.6. Laborers' costs

The rehabilitation projects did not expect or force landless laborers to provide free labor or money for the construction, unless they were also tenants. The survey found that no one who identified himself primarily as a laborer reported working on the rehabilitation.

The main cost of the rehabilitation to laborers in Kikavu Chini was intangible. Women laborers told us that they had expected the 400 acres of rain-fed land in Upareni sub-village to be irrigated by the rehabilitation project. They had hoped that an increase in the supply of irrigated land would allow them to rent land on easier terms. When the project ran out of funds, the expansion of the scheme was cancelled and the laborers' hopes were dashed.

Many laborers on irrigation schemes aspire to become tenants or owners. It is not easy, however, to save enough money to rent a field. If a laborer depends entirely on agricultural wages for basic needs, it is not possible to save enough money to rent even a small field. To amass enough capital to rent land, laborers must combine working for other farmers with some type of micro-enterprise or other part-time work.

The mixing of the roles of tenant and laborer has important implications for our analysis. To gain a correct perspective on how the rehabilitation of an irrigation scheme is

affecting laborers, we need to observe how it is affecting tenants. If rents rise faster than productivity, tenants may be worse off after a rehabilitation project than they were before.

A. The distribution of benefits and costs by age and gender

7.2.1 Male elders

In the past, the founders of traditional irrigation schemes controlled the management of the scheme, appointed water distributors, and distributed plots. As the rehabilitation of traditional schemes brought new technical complexities and new organizational demands, younger men and women with secondary school educations were often brought into leadership positions.

The sharing of power between the older elites and the younger leaders is not always easy. Young leaders tend to be more open to equitable arrangements regarding cost sharing, work sharing, and land distribution. The founders may not welcome this implicit assault on their patriarchal privileges. Younger leaders may find that elders reject proposals to force larger landowners to share resources with women and youth.

Tensions of this type were observed in all the cases studied. In each village, for example, there had been an attempt to have water fees assessed according to acreage owned, but this never seemed to work properly in practice. It is clear that the larger landowners resisted this change, and the younger leaders were unable to force the issue. On the other hand, some older men complained that they could not get what they considered proper treatment from the WUA.

7.2.2 Young men

Young men have traditionally been expected to do the heavier work of farming, including the tasks of digging and cleaning irrigation canals. In the past, young men worked for their fathers without monetary payment or other direct benefits. Their work was not, however, entirely unrewarded. Male elders were socially required to give their sons and other male dependents increasing access to productive resources, especially land, and to provide younger men with social and monetary assistance in obtaining a wife. Today cultural norms are still honored in principle, but younger men are increasingly reluctant to provide free labor because many fathers have so many children that it is impossible for them to give land to all their sons, or to pay school fees, or to provide assistance with the financial demands of marriage.

As the traditional obligations toward young men become economically difficult, if not impossible, for many fathers, younger rural men increasingly face poverty, unemployment, and lack of access to the resources that would enable them to significantly change their situations. Adding to their dilemma is the social alienation that results from their inability to make a decent living. Lacking access to land and

capital, young men leave the villages in droves, but because economic opportunities in the urban areas are few, many are forced to return.

What young male villagers need most desperately is land, capital, and respect. We found all these elements in short supply in both the villages we studied. Alienation and pessimism among young men was the worst in Kikavu Chini. In this village political parties had apparently formed along generational lines. The recent campaign had brought generational tensions to a fever pitch, leading to the arrest of many young partisans on the very eve of the election.

The problem of alienated youth was not limited to Kikavu Chini, however. Young men were similarly disillusioned in Mtandika. The failure of the rehabilitation projects to reward their labor with improved access to land had provoked barely hidden bitterness. Rising land rents were an additional, and unexpected, blow to the landless youth who had born the costs of scheme improvements only to see the benefits they had anticipated turn into additional costs.

In Msosa negative repercussions of the rehabilitation were avoided due to the land distribution. Landless men received plots of a third of an acre, not enough, perhaps, to support a family, but since their wives also received a quarter acre, most people felt that their economic situations had been significantly improved. Only those young men who had been temporarily away during the land distribution or those who were denied plots because they came from big landowning families showed any trace of the bitterness and despondency so evident among male youth elsewhere.

7.2.3 Young women

Young women's difficulties are increasingly similar to men's. They have inadequate access to land and other resources. Traditionally, women farmers gained access to resources through their husbands, so marriage apparently solved their problems. The reality, however, was not so simple.

Marriage brings young women heavy responsibilities, but few resources. Young wives are expected earn enough money to provide food and clothing for their children even though they are denied access to land in their own right. Wives must also help their husbands grow cash crops but they cannot demand an equitable return for their labor on their husbands' fields. Younger women are often so weighted down by the demands of pregnancy, childrearing, and twelve plus hour labor days that they have little energy to think about acting politically. Increasingly, however, their mothers are speaking up for them, agitating to raise the customary age of marriage and even supporting the choice of a single life and independent access to land for young women.

7.2.4 Mature women

Mature women are usually somewhat better off than younger women. After several years of marriage, some married women can make more egalitarian arrangements for sharing

income from cash crops with their husbands. In other cases, for example, if the husband takes a second wife, or, at times, even if he does not, he may give his wife a field and allow her to farm on her own account. Finally, if women are not able to improve their situations within their marriages, divorce is an increasingly acceptable option.

Divorced or widowed women with children increasingly recognized as a group with legitimate claims to land in irrigation schemes, but their success in actually receiving land depends on whether or not the scheme can be enlarged and on the level of competition for land with landless men. Because rehabilitation projects have rarely paid attention to the possibilities for land redistribution, most often women without husbands must rent plots.

7.3 The benefits of a more equitable distribution of costs and benefits

The evidence from this comparative study of three irrigation rehabilitation projects suggests that significant social benefits can be expected from policies and practices that lead to a more equitable distribution of costs and benefits. One of the most effective ways to spread the benefits of a rehabilitation projects is to distribute land. In Msosa village, where 500 landless men and women were promised very small plots in the rehabilitated scheme five years before they actually began receiving water, the amount of money and labor they contributed to the long and complex rehabilitation process was significantly greater than that contributed in the other schemes studied.

The following points summarize the benefits from more equitable distribution of benefits:

- Capital cost recovery will be higher in projects that take measures to distribute benefits widely because a larger number of people will contribute greater amounts of labor and money to the project.
- People who feel that they have benefited from a rehabilitation project are likely to be more interested in the efficient operation and management of their schemes. Greater cooperation from a larger number of farmers will result in more efficient water use.
- If more farmers gain reliable access to irrigated plots, larger numbers of people will be available for scheme maintenance. This will make it easier to organize repairs and maintenance work on a regular basis.
- Farmers who have a stake in the sustainability of their scheme can be expected to cooperate more fully in projects to solve erosion and other environmental problems affecting the scheme.
- If more farmers are owners rather than tenants, they will have greater financial capacity to pay annual water fees to River Basin Offices.

7.4 How to promote a more equitable sharing of costs and benefits.

This section is based on our observations of best practices in the Kikavu Chini, Mtandika, and Msosa rehabilitation processes, with a few additional ideas from other Tanzanian rehabilitation projects. We also include observations on what to avoid.

Encourage distribution of newly irrigated land to the landless

The concentration of project benefits in the hands of landowners is not inevitable. The distribution of benefits can be spread far more widely if villagers and their leaders are willing to take measures to improve the access of landless women and men to irrigated land.

In Msosa village, the Traditional Irrigation Improvement Program (TIP) helped the village council convince people to work out a plan to distribute land. There were five factors that made this plan socially acceptable:

- a) The rehabilitation brought 80-100 acres of rain-fed land that the village government had controlled for many years under irrigation.
- b) There were a large number of landless men and women in the village who had been forced to abandon their own village under the 1970s villagization policy.
- c) The landless had contributed to the rehabilitation of the scheme.
- d) The process of distributing land in Msosa was open, participatory, and widely perceived as fair.
- e) No land that was already irrigated before the rehabilitation was included in the redistribution plan. This made it easier to gain the support of the powerful landowners.

In Kikavu Chini, the distribution of formerly rain-fed land would have undoubtedly been difficult, but perhaps not impossible. For one thing, the 100 acres of rain-fed land in Landi sub-village that was irrigated due to the rehabilitation was held in very large parcels. The village council and the Irrigation Section could have argued that large landowners would have to develop a plan to distribute landholdings over a certain size before the project would assist with the rehabilitation.

Encourage redistribution of very large farms that are already irrigated land

In Mtandika, there was another missed opportunity to redistribute land. TIP did not attempt to promote plot redistribution because the village council had already distributed nearly all the land that could be irrigated. On the other hand, before the rehabilitation,

land in the irrigation scheme could not be fully irrigated because of low water levels. Most landowners usually received only enough water to irrigate half their plots. This meant that the rehabilitation would have the effect of doubling the amount of land each owner could cultivate or rent out.

In this case, an argument could have been made that since most landowners had been allocated irrigated plots for free ten years earlier, and since there were now many more young men and women with no access to land, villagers should attempt to develop a plan to increase the benefits of the rehabilitation for the landless. Perhaps landowners with plots over a certain size could have allocated their “excess” land to landless persons of their choice. This arrangement could have even been limited to only those cases where the village council had given multiple plots to the same person. If none of this was acceptable, a proposal might have been made that owners who had rented out plots they had received for free should be required to give those plots to relatives.

There are many possibilities for distributing the benefits of rehabilitation more widely by reducing the concentration of land ownership. For example, the village council and irrigators’ organization could attempt to:

- Persuade owners of rain-fed land that would be irrigated by the scheme to distribute holdings over a certain size.
- Persuade owners of land that is already irrigated to distribute plots to their wives and children and then register the new ownership agreement.
- Require owners of irrigated or rain-fed land to be irrigated by the project to sell holdings over a certain size to other villagers. The prices for these transactions could be set by a village committee elected to evaluate the value of the improvements made in the land by the owner.

All these ideas have been tried in Tanzania. They are presented here not to recommend that they be imposed by projects, but rather to illustrate that there are many ways to promote land redistribution.

We do recommend, however, that before government or NGOs agree to contribute to financing an irrigation scheme rehabilitation project, villagers whose schemes have large disparities in land ownership (which will mean that large owners will receive the bulk of the benefits of the rehabilitation) should be advised that if they want external financing they must develop a socially acceptable plan for redistributing irrigated holdings over a certain size.

Other ways to improve the benefits of rehabilitation projects for the landless men, women, and youth

The following ideas can be used to open discussions with villagers about methods for improving the distribution of benefits from the project. They might stimulate villagers to come up with ideas that will accomplish the same objectives in a more locally acceptable fashion.

- Pay landless people for the work they do on the rehabilitation. Raise funds by taxing landowners based on the size of their holdings.
- Discourage large renters from outside the village. Require tenants who rent more than an acre of land to pay additional fees, with rates that rise progressively with the number of acres rented.
- Encourage villagers to work out agreements between renters and owners. This might include setting limits on rents, regulating the timing of rental payments, and so forth.
- Encourage local tenants and laborers, including young people and women who may be struggling to make a living, to join the irrigators' organization.

Meetings to discuss ideas for improving the distribution of benefits in a rehabilitation project should always include those groups in the community who are less likely to benefit, like tenants, women, and youth, as well as village leaders and landowners.

Require that non-village recipients of rights of occupancy to village land pay rent that can be used to provide irrigated plots to landless villagers

In Mtandika, where rain-fed land is plentiful but cannot be farmed productively unless it is irrigated, we encountered the practice of giving very large tracts of village land to local and regional elites who then irrigated it with private pumps. The rationale for giving land to outsiders was that these people have the means to invest in making the land productive, while landless people from the village do not. This is indeed true, but it does not mean that village councils should grant rights of occupancy to this highly valuable village resource for no return. The Village Land Act of 1999 stipulates that “the village council may require the payment of an annual rent for a customary right of occupancy from a non-village organization or a person or a group of persons”.^{xlvi}

These rental payments can be used allow groups of village youth to develop land (possibly by buying irrigation pumps) that they can farm. Alternatively, in place of annual rent payment, the non-village recipients of village land could choose return a portion of the land to the village after it is developed. This land could then be distributed to landless men and women from the village.

In cases, like Mtandika's where the land given to private individuals was to be irrigated by private pumps, the village government could require that the person who had been granted a right of occupancy should provide a pump for a portion of the land he or she was required to return to the village. Alternatively the recipient of the land could be required to lease a portion of the land to villagers for a sum that would be set in advance.

VIII. SUMMARY OF LESSONS-LEARNED AND RECOMMENDATIONS

This report contains a number of lessons drawn from the analysis of the research results as well as lessons suggested by collaborators from the irrigation section, by district staff working in the villages where the research took place, and, above all, by the villagers who participated in the research. Many of these lessons have been discussed in the concluding sub-sections of sections 3-7 of this report. They are presented here in summary form along with recommendations for changes in policy and practice that can make participatory approaches more effective and rehabilitation projects more sustainable.

1. If villagers' rights as owners of their traditional irrigation schemes are not respected during the planning and implementation of a rehabilitation project, the sustainability of the scheme can be seriously compromised.

Conventional approaches to rehabilitation project planning and implementation tend to marginalize farmers. This report has shown how failing to involve villagers in decision-making for the rehabilitation seriously undermines their ability to operate and maintain their schemes.

Participatory approaches demonstrate that if rehabilitation projects are to be effective and sustainable, all agencies involved must collaborate fully with villagers from the earliest stages of the project. Village councils and irrigators' organizations must participate in planning activities, like feasibility studies, design, and financial planning, in implementation, and in physical and financial monitoring of the project. In cases of conflicting opinions, villagers should have the last word.

Most planning should take place in meetings conducted in the villages. More meaningful participation of women, youth and the landless can be achieved if separate meetings are held for these groups prior to village-wide meetings. Participants in the smaller meetings should analyze issues and appoint representatives to present their recommendations at the larger meetings.

Participants in the research workshop pointed out that some technical staff, like irrigation engineers, may not see the need for this level of collaboration with villagers. This means that awareness campaigns and training for government staff as well as villagers are crucial to ensuring that villagers maintain ownership of their schemes.

2. Mutual accountability among implementing and funding agencies, contractors, and villagers is critical to ensure cost-effective implementation and technical sustainability. Accountability should be secured with legally enforceable contracts.

Contracts are the conventional means of assuring accountability. They also have important functions in participatory approaches, where their scope should be broad enough to provide a context of mutually understood responsibilities among stakeholders. A rehabilitation project may involve several contracts.

Contracts will be most effective when developed in a participatory and transparent manner so that all parties understand and agree to honor the commitments they embody. Contracts between funding and implementing agencies and private contractors should be drawn up with the participation of villagers and local authorities. Technical specifications as well as agreements about the provision of labor, materials, and technical support by different parties to the contract should be negotiated in the context of meetings conducted in the village. This will permit villagers to offer their perspectives and recommendations and will ensure better compliance with the terms of the contract. Villagers should be signatories in all contracts that affect their irrigation scheme.

Contracts are an important means of assuring mutual accountability. They should protect the rights of villagers as owners of the irrigation scheme by specifying which parties are financially accountable for technical failures or problems. At the same time, contracts should specify the rights of funding and implementing agencies to withdraw their assistance if villagers do not fulfill the responsibilities they engage to undertake.

Accountability and trust can be strengthened if irrigators' organizations are involved in financial planning and record keeping. In Mtandika villagers controlled the funds they had contributed as well as funds granted by TIP. They purchased and stored the materials needed for the rehabilitation, keeping records of all transactions. According to the community development officer who acted as the TIP project manager, this process gave people the experience needed to better maintain and repair their schemes.

3. District staff should participate in the planning and implementation of rehabilitation projects. This will help staff gain the skills needed to collaborate more effectively with villagers both during and after the rehabilitation.

District and local authorities and technical staff need to be involved in the planning and implementation of rehabilitation projects from their earliest stages. If district and ward officers don't have experience with participatory methods, they should receive supplementary training. This may involve training in participatory methods of working with irrigators' organizations, methods for promoting the participation of women and youth, and methods for negotiating and agreeing on the roles and responsibilities of different stakeholders in the rehabilitation process.

District staff should work as a team, rather than as individuals competing for allowances. The local irrigation technician, agricultural officer, and community development officer should work regularly with the implementing agency and villagers in planning and

carrying out the rehabilitation. Other government staff, like the cooperative officer and district planning officer, should be called on to attend specific meetings or problem solving discussions.

A district development officer familiar with participatory approaches to irrigation projects emphasized that it is dangerous to treat a rehabilitation project as something separate from regular government work. When district officers work with an externally funded project, they need to keep up their regular activities and continue reporting to their normal government bosses. If government officers work only because there is a “project”, villagers may think that they themselves don’t have an obligation to work because the project will provide everything.

If a project that uses participatory methods is integrated into regular government work, when the project ends the extension staff will know how to assist with collaborative problem solving. They will understand the problems of the rehabilitation and should be able to offer relevant advice when villagers need assistance. Even if they have fewer funds for travel allowances or training, they are likely to retain their superior skills and collaborative style of work.

Villagers, for their part, are likely to have formed a different relationship to government staff. In Mtandika one villager said that, “Before TIP we didn’t know how to use our agricultural extension agents and irrigation technicians well. Now we do, and we are not afraid to call on them for help.” District authorities reported that some villagers even pay for food and travel allowances because they know the value of the assistance that government staff can provide.

4. Many government officers and technical staff need to be better trained in participatory methods of irrigation project planning, implementation and monitoring.

Participatory training emphasizes working together with trainees to analyze problems and develop problem-solving approaches together. Trainers offer information about similar situations, but do not offer top-down advice or directions because they realize that all situations differ and all “solutions” must be appropriate to the local context to be effective. Training in participatory methods of work is essential for all stakeholders if participation is to lead to socially, economically and environmentally sustainable irrigation systems. Government staff needs training to be able to use participatory methods in their work and to teach them to villagers. They must learn how to engage in dialogues with villagers based on solving the problems that villagers prioritize. They need to learn methods for engaging all the major socio-economic categories of villagers in the analysis of issues and problems.

Irrigation technicians, agricultural extension agents, community development officers and other staff working in the village need to be able to teach methods of gender analysis that will help villagers become aware of how gender differences in the division of labor and gender differences in access to and control over resources like irrigated land hinder women’s ability to fulfill their responsibilities and reduce family welfare. Training in

gender-sensitive participatory methods can also be extended to the analysis of social differences based on age and wealth that will allow technical staff to help village leaders work more effectively and equitably with all categories of villagers.

Village council members and irrigators' organization leaders also need training in participatory methods for their work with farmers. They must be able to perform technical functions like financial analysis and planning and to engage villagers in participatory processes of determining priorities for the spending of the funds collected by irrigators' organizations. They must also learn to improve the ways they share information with villagers and to elicit villagers' cooperation in the operation and management of the scheme.

5. Training must not depend on donor funding alone.

If the government's stated intention to use participatory methods is to be realized, central government and district councils must provide funds for both staff training and villager training. Project-funded training of trainers will have little positive effect if local government staff are not provided with financial resources to train villagers and to respond to their requests for follow-up assistance.

If training is to effectively contribute to the sustainability of irrigation schemes, it needs to be planned in a participatory manner, properly sequenced, and followed-up. Training needs analyses, for example, must be undertaken with villagers who are requesting training. Training for village leaders should be given when it is most needed, ideally in the context of project planning and during the formation of irrigators' organizations. Follow-up training and follow-up support should respond to villagers' own assessments of their needs.

6. Managing an irrigation scheme is a difficult job. Irrigator's organizations must learn to operate and maintain their schemes effectively before taking on other functions like marketing. New irrigators' organizations should become associations, not cooperatives.

A major lesson of the research was an appreciation of the daunting challenges villagers face in operating and maintaining their irrigation scheme and running their irrigators' organizations. We review some of these challenges here and provide recommendations on how government can assist.

The most difficult challenges of running an irrigators' organization revolve around financial planning, money management, and sharing information about the financial situation of the organization. Financial management is an area where training has been deficient in all the cases studied. External audits by cooperative officers, which might have been occasions to train leaders in financial management, did not assist leaders in gaining financial management skills. Bookkeeping training alone was too narrow and sometimes too technically complex to fill the gap. As a result, the leaders of irrigators' associations lack appropriate financial analysis and management skills.

Because their leaders cannot provide appropriate and clear information about the financial situation of irrigators' cooperatives, villagers are skeptical that the money they pay in water fees is being properly used. Leaders of irrigators' organizations need to know how to effectively share information about income and expenditures if villagers are to trust them. Trust, in turn, is critical to people's willingness to provide free labor for maintenance and repairs and to pay water fees.

Due to the increasing legal and financial complexities of running irrigators' organizations, the founders and elders who previously controlled traditional irrigation schemes have transferred the formal management functions to younger, more educated villagers. The elders, however, may not agree with changes advocated by the younger leaders and may not cooperate, especially when the proposed changes would lessen their advantages. Among the changes that are likely to face resistance from male elders are policies to base water fees on acreage owned, policies to improve the access of women and youth to land through agreements to limit rents, and so forth. The inability of young leaders to effect the changes they advocate weakens their legitimacy. It can also sap their enthusiasm and negatively affect the management of the scheme.

The leaders of irrigators' organizations need to learn participatory methods for gaining the cooperation of many different types of farmers. Skills in conducting meetings that allow leaders and landowners to listen to and learn from different groups (women, youth, tenants, landless people), to rank problems and analyze potential solutions, and to generate enthusiasm for taking collective action are particularly needed. Priorities need to be set in a participatory manner if most people are to agree to an action and to provide support. Leaders need to know methods for dealing with non-cooperation and conflict.

Leaders must also be able to analyze technical issues, deal with breakdowns, and decide which repairs are most critical. If the agencies implementing the rehabilitation did not give village leaders practical experience dealing with technical matters, leaders may be unable to properly maintain their rehabilitated schemes.

To lead an irrigators' organization is a high stress, low reward position. The leaders willing to perform these services for their communities need to be able to count on district and local government staff for on-the-job training and advice that is appropriate to their situations.

Given the enormous challenges of managing an irrigation scheme, the research findings strongly suggest that in the early stages of the development of an irrigators' organization, villagers should not be urged to form their organization as a cooperative. When a cooperative form of organization is chosen, leaders of the irrigation scheme are expected to take on many additional responsibilities and expenses that are not central to the proper operation of the scheme. Among these are requirements to open an office, hire a full-time manager, run an input supply shop, and market farmers' output. These are not the priority issues that the leaders of a newly rehabilitated irrigation scheme need to deal with.

7. Water Fees: The collection of government imposed water fees by newly formed irrigators' organizations can threaten the sustainability of the organization if leaders do not yet have the skills to manage money in an open, participatory, and effective manner. If the annual water fees are not equitably assessed, the legitimacy and sustainability of irrigators' organizations will be further damaged.

The Ministry of Water sets fees for water use with the goal of convincing citizens to make more rational and efficient use of this scarce natural resource. The Ministry's Water Basin Offices have recently begun assessing fees for traditional irrigation schemes based on the capacity of the intake of the irrigation scheme.

The research identified several issues regarding assessment and collection methods that need further consideration from policy makers. They are:

- Administration issues: Particularly whether or not irrigators' organizations should be required to collect the water fee
- Equity issues: The effects of taxing farmers in traditional irrigation schemes but not farmers operating private pumps
- Fairness issues: The effects of basing water fees on intake capacity

We consider each of these issues in turn.

Irrigators' organizations have been designated as local collection agents for the annual water fees. This makes sense from the point of view of the Water Basin Offices, but could be harmful to these new village organizations, especially in the first years of their existence.

The research found that irrigators' groups have very little capacity in financial planning, management, and reporting. This threatens their legitimacy in the eyes of farmers. Farmers think that the water fees they pay should be used for the operation and maintenance of the scheme. But since farmers are not usually informed about how the money is actually being used, if they do not see concrete results, like scheme repairs, they become reluctant to continue paying. This leads to an increasing use of force on the part of the irrigators' organization (like withholding water from non-payers), which, while solving the immediate problem of getting money, takes a further toll on the ability of the irrigators' organization to get farmers to cooperate in the maintenance of the scheme. If not turned around, this situation will not only discredit the current leadership, it may threaten the sustainability of the scheme as well.

If newly formed irrigators' organizations are required to collect water fees for the Ministry of water before their leaders have developed adequate skills in financial management and reporting, this additional responsibility could further weaken their legitimacy in the eyes of farmers.

An alternative would be to place the responsibility for collecting the water fee on the village council, at least in the initial period. When the irrigators' organizations are better able to manage and report on the various funds they already collect, they could take over. In order to speed up this process, River Basin Offices should consider developing a course in financial management for irrigators' organizations.

The second issue for consideration by the Ministry of Water is the equity problem created by the current practice of imposing the annual water fee on irrigators' organizations but not on private pump irrigators. The importance of this issue is illustrated by the case of Mtandika village where 42 private pump owners are irrigating a total area of 700 acres. The traditional scheme's command area is only 400 acres. When we asked River Basin Office Staff about the water fee policy for pump operators, they pointed out the difficulty of collecting the fees from individuals.

While the trade-offs between ease of administration and equity is a classic problem of tax administration, we think that it is extremely important that the water tax be distributed equitably within villages. It is especially important to require pump operators to pay the annual water fee, because they are normally far wealthier than most farmers with plots in the traditional scheme. When farmers realize that their wealthier neighbors are not paying the water fees, they too will be inclined to try to avoid paying the fee.

Mtandika's case illustrates how this type of equity problem can compound the legitimacy problems of the irrigators' organization. If the Mgambalenga irrigators' association has to pay the water fee even before it can attend to priority repairs on the scheme itself, while the relatively well-to-do pump operators pay nothing, the WUA can be seriously weakened.

The third problem with the administration of the water fee is the practice of basing it on the intake capacity of the scheme. Since the intake capacity is fixed, administration of the fee is simplified. This practice, however, poses another serious equity issue, namely the problem of unfair taxation for schemes that depend on small or ephemeral rivers. In these cases, low rainfall can drastically reduce the amount of water available to the scheme. If farmers don't get adequate water, their yields and their incomes are reduced, and their ability to pay the fee is compromised. To avoid overtaxing farmers in schemes where actual water use depends on the amount of rain, the River Basin Offices need to take rainfall data into account when setting the annual fee payments.

Finally, there should be a mechanism by which village governments and/or irrigators organizations can review the calculations on which their annual water fees are based. The situation in Kikavu Chini illustrates this issue very well. The intake was designed to provide water to a scheme that is 40 percent larger than the current command area. This means that if irrigators pay water fees based on the full intake capacity, they would be paying for about 40 percent more water than they actually use.

Other problems can also affect how much traditional schemes should be charged. Kikavu Chini provides another example. Here about half the water in the main canal flows back

to the river before reaching 80 percent of the farmers in the scheme. Water Basin Office assessors need to take such local problems and issues into account when setting fees.

8. Land and Labor Issues: Irrigation rehabilitation projects change land values and income distribution. Owners are able to charge higher rents, which can reduce the access of landless tenants, wives, and young people to irrigated land. Rehabilitation projects should encourage villagers to develop socially acceptable methods to reduce the inequitable concentration of benefits on landowners. Funding agencies should consider making financial assistance conditional upon the development of a plan for redistributing newly irrigated land or portions of irrigated farms over a certain size to the landless.

The rehabilitation of traditional irrigation projects inevitably increases the value of land because the amount and reliability of its water supply is improved. Land that changes from rain-fed to irrigated due to an expansion of the scheme undergoes an even greater increase in value. The benefits of rising land values are concentrated on owners. This changes the conditions of the explicit and implicit contracts that owners make with non-owners and creates pressures that can lead to changes in socio-economic status. As owners seek to realize the benefits of rising land values, tenants, owners' children, and even their wives may find that the terms of their access have changed. Marginal groups may lose access altogether.

The greatest negative pressure is on tenants. At the very least they must pay higher rents. Even so they are vulnerable to losing access to land. If this happens renters may have to seek less remunerative work as laborers. Rising land values can also negatively affect owners' children and wives. If an owner seeks additional revenue by renting out his land, his dependents may be forced to rent plots from other farmers. Failing this, they too may have to work as laborers. Since laborers incomes are far less than those of owners and tenants, if no countervailing measures are taken, these effects can be expected to widen income disparities and negate the poverty alleviating potential of a rehabilitation project.^{xlvii}

The negative repercussions of rehabilitation projects on the landless need to be taken seriously. They can be reduced if traditional schemes can be expanded so that more farmers can gain secure access to land. Where it is not possible to expand a traditional scheme, a policy of promoting participatory village planning for plot redistribution within the existing scheme needs to be considered. Where land ownership is highly concentrated, funding and implementing agencies should consider making land redistribution a condition of assistance.

9. The success of capital cost recovery for irrigation projects depends heavily on the distribution of scheme benefits. Landowners, as major beneficiaries, should contribute to cost recovery based on the amount of land owned. If tenants and laborers are not expected to receive plots, they should not be expected to contribute to cost recovery.

There are two ways that villagers contribute to the capital costs of a rehabilitation project: monetary contributions and the provision of unpaid labor. Historically, unpaid labor has been by far the predominant form of contributions. Since this labor contributes to capital cost recovery, it should always be fully recorded and systematically given a financial value.

This report has dealt with the factors affecting people's willingness to provide unpaid labor. We have argued that when villagers expect clear benefits from a rehabilitation project, they will be willing to provide more free labor than they would contribute if their only motivation for working is to avoid sanctions. This means that the cost of projects that pay attention to an equitable distribution of benefits will achieve higher levels of cost recovery. The case of Msosa provided strong evidence supporting this argument.

The factors that affect people's willingness and ability to contribute money to a project are more complex, because they are affected by two factors: expected benefits and socio-economic status. Since owners will clearly benefit financially from a rehabilitation project, they should contribute to capital cost recovery according to the amount of land they own. Non-landowners may have very little capacity to contribute money, but they may have far more incentive than owners to provide labor if they can be certain of benefiting from the project.

The analysis of the distribution of costs and benefits among owners, tenants, and laborers in section seven suggests that without land distribution, landless tenants and laborers are unlikely to benefit significantly from the rehabilitation. Indeed, if the price of renting land goes up more than the improvement in the tenant's productivity and profits, tenants may actually have higher costs than benefits. If no measures are taken to assure that the landless have positive benefits from the rehabilitation, any attempt to get them to contribute to capital costs will only make the distribution of costs and benefits more inequitable.

For these reasons, we recommend that unless land distribution is part of a rehabilitation project, tenants and laborers should not be expected to contribute financially to capital recovery. They should also not be expected to contribute free labor. Landless farmers should be paid for the work they do on the rehabilitation.

10. Social and cultural issues: The social marginalization of women, youth, and the landless restricts their participation at all stages of an irrigation rehabilitation project. A participatory analysis of the social and cultural constraints on marginalized groups can help villagers develop locally appropriate ways to help these groups benefit from the project. Standard methods of gender analysis training can facilitate this analysis.

Conventional approaches to irrigation rehabilitation tend to ignore the fact that the social and economic marginalization of large segments of farming communities seriously limits their ability to benefit from an irrigation project. This report has attempted to show that

failing to deal with socio-economic and gender differences can threaten the success and sustainability of a rehabilitation project.

The Traditional Irrigation Improvement Program (TIP) developed effective methods to reduce women's social marginalization by providing gender analysis training for both district staff and male and female villagers. Gender training creates an awareness of differences in men's and women's economic roles, access to resources, and participation in decision-making. TIP adapted standard gender training tools to the needs of a rehabilitation project. The analysis of roles, for example, was focused on who does what work on irrigated crops and who controls the output; the analysis of access to and control over resources considered access to irrigated plots and why it is differentiated by gender; and the analysis of decision-making examined constraints on women's participation in irrigation scheme management. TIP's gender training models should be studied by other agencies implementing irrigation rehabilitation projects.

Gender training tools can also be adapted to help villagers analyze differences based on other factors like age, ethnicity, and socio-economic status. The analysis of differences in roles, the division of labor, access to and control over resources, and participation in decision-making works as well for differences based on age and socio-economic status as it does for gender. Tools like role-playing can bring this analysis alive by situating it in the local context. Once this analysis is completed, villagers are often highly motivated to identify appropriate actions or changes to involve marginalized groups more fully in the rehabilitation process and to seek ways to improve their access to the benefits expected from the rehabilitation.

Gender, age, and socio-economic difference analysis can be followed up with discussions about the benefits and costs of the project and how benefits are concentrated on owners. At this point villagers may become interested in tackling the land issue. If they can work out socially acceptable procedures to improve the access of landless groups to irrigated plots, gender and socio-economic difference training will have contributed significantly to improving the equity effects of the projects. Finally, if we are correct in arguing that equity improves participation, and participation in turn improves the effectiveness and sustainability of an irrigation project, the training will have contributed significantly to the overall success of rehabilitation projects.

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ANNEXES

Annex One: Research Methods

The research was carried out in two distinct periods: January to March and June to August 2000. The first phase began with discussions on research issues and sites with members of the Irrigation Section. It continued with field research in two villages: Kikavu Chini in Kilimanjaro Region (located 10 kilometers south of Moshi town), and Mtandika in Iringa Region (located 100 kilometers east of Iringa town). Three to four members of the core research team spent just over two weeks residing in each village.

During the second phase of the research, the fieldwork continued with villager-conducted random sample surveys in Kikavu Chini and Mtandika. The core research team also conducted six focus group discussions in a Msosa, a village in Iringa region that had distributed land to 500 people as part of its rehabilitation.

- *Focus group discussions and analysis of priority issues*

At each site the executive committees of the respective village councils assisted the team by scheduling meetings with different community groups. Meetings were by open invitation, but each meeting was intended for a different type of focus group: the village council, the executive committee of the irrigators' organization, water distributors, men landowners, women landowners, men and women tenants, and men and women laborers.

Village officials helped publicize these meetings. In Mtandika public announcements were also posted to emphasize that the meetings were open to all interested persons. An important lesson learned from this experience is that written public announcements are especially important for those people who may feel socially marginalized or simply not known by village leaders. Participants also suggested that inclusiveness in participatory research would be enhanced if announcements are made through churches or mosques.

Each focus group of about five to twenty five persons met with the researchers for two different sessions. Most discussions lasted about two hours. During the initial meetings participants were encouraged to describe and analyze their participation in the planning and rehabilitation of the irrigation schemes, to compare the before and after situation in irrigated farming, to analyze differences in their expectations and the actual results of the rehabilitation process, and to bring up other issues they wanted to discuss. During the second meeting, groups focused on analyzing and prioritizing the problems and issues they had identified. This minimalist structure was flexible enough to allow the group to pursue other topics they considered relevant. The collaborative approach to the shaping of the research focus yielded important insights into the different ways that rehabilitation projects affect different community groups.

The focus group meetings were followed by a village-wide meeting in which each group presented its analysis and its ranking of issues and remaining problems. These meetings were attended by 75-150 people (including government officers who had worked with

villagers during the rehabilitation) and resulted in animated discussions. Toward the conclusion of each meeting, several village “elders” commented that they had appreciated the meetings and had learned from them.

- ***Random sample of farmers and laborers in the rehabilitated schemes***

After a preliminary analysis of the results of the first phase of the research, a questionnaire was drafted to provide more systematic quantitative evidence on some of the major issues addressed in the first phase of the research. The research team then returned to Kikavu Chini and Mtandika in July. Twenty to twenty five volunteers from each village came together as research associates to refine the questionnaire, add their own questions, and administer the questionnaire to a random sample of 80 farmers in each irrigation scheme.¹ The village enumerators worked enthusiastically and tirelessly and produced excellent results. The data were checked by the core team and sometimes rechecked by the enumerators before being entered into a statistical analysis program. Finally, preliminary results were presented to a village wide meeting for discussion. Again, the turn out in each village was good and the discussion was lively.

- ***Workshop***

The research concluded with a two-day workshop in Dar es Salaam attended by 15 villagers, 15-20 members of the Irrigation Section, and some 20 regional and local government officers, NGOs, and donors. The workshop highlighted villager prioritized issues with policy and practical implications for all agencies engaged in irrigation rehabilitation and water management issues.

During the first day, when discussions were in Kiswahili, villagers presented their analyses of technical, participation, and land distribution issues. The research team also presented its preliminary research findings, with emphasis on issues of accountability, sustainability, and the different costs and benefits of rehabilitation projects for different segments of a community.

On the second day, which was conducted in English to accommodate donors and international organizations, participants developed recommendations on how government, NGOs, and donors can improve community participation in irrigation projects.

¹ The sample base was a census of all owners, tenants, and laborers working in the irrigation scheme during the previous season. Informants from each sub-village used the 1998 population census to identify all persons who engage in irrigated farming.

Annex Two
Research Workshop: Program and Recommendations

I. Workshop Program

WORKSHOP ON COMMUNITY PARTICIPATION IN IRRIGATION
August 10-11, 2000
Irrigation Section--Ministry of Agriculture
Economic and Social Research Foundation, Dar es Salaam

Thursday 10 August

- 8:30-9:15 Opening Assistant Director of Irrigation G.M. Kalinga
Introduction of Participants
Workshop objectives and schedule
- 9:15-9:45 Presentation by the team from Kikavu Chini Village
9:45-10:15 Discussion
- 10:15-10:45 Presentation by the team from Mtandika Village
10:45-11:15 Discussion
- 11:30-12:00 Presentation by the team from Msosa Village
12:00-12:30 Discussion
- 12:30-12:45 River Basin Offices and Annual Water Fees
Representatives from the Rufiji and Pangani Water Basin Offices
- 12:45-1:00 Comments by Kilimanjaro Irrigation Office
1:00-1:15 Comments by the Traditional Irrigation Improvement NGO/ TIP
1:15-1:30 Discussion
- 2:15-2:35 Making Schemes Sustainable: A Review of Technical, Organizational,
and Accountability Issues Jeanne Koopman
2:35-3:00 Discussion
- 3:00-3:20 How to Make Participation Effective: Organizational and Training Issues
Mary Mboya
3:20-3:30 Role of the Department of Community Organization in helping form and
support Irrigators' Associations
3:30-3:45 Role of the Department of Cooperatives in assisting Irrigators'
Associations and/or Cooperatives
3:45-4:15 Discussion
- 4:30-4:50 Participation, Gender, and Access to Land: Benefits and Costs of
Participation for Owners, Tenants, Laborers, Women, Youth
--Rhoda Kweka

4:50-5:15 Discussion
5:15-5:30 Closing Summary of Major Issues by Villagers

Friday 11 August 2000

8:30-9:15 Opening and Review of Issues Presented to Workshop by Villagers
--Prof. Wangwe Executive Director ESRF

9:15-9:45 Participation, Gender, and Access to Land: Benefits and Costs of
Participation for Owners, Tenants, Laborers -- Rhoda Kweka

9:45-10:15 Discussion

10:15-10:30 Making Participation Effective: Organizational and Training Issues
-- Mary Mboya

10:30-11:00 Discussion

10:45-11:15 Making Schemes Sustainable: Technical, Organizational, and
Accountability Issues: Should There Be Contracts? Jeanne Koopman

11:15-11:30 Contracts and Other Lessons from the River Basin Management and
Smallholder Irrigation Improvement Project --Mr. Masija

11:30-12:00 Discussion

12:00-12:15 Comments by the Kilimanjaro Zonal Irrigation Office

12:15-12:30 Comments by the Traditional Irrigation Organization (TIP) Mr. Mwangi

12:30-12:45 Water Basin Offices, Water Fees, Environmental Protection
-- Mr. Mutayoba

12:45-1:15 Discussion

2:00-3:30 Small Group Work

A. How can the Irrigation Department (or Agency) Promote Participation,
Accountability, and Sustainable Schemes? Implications for Staffing,
Staff Training, and Operational Funding.

B. How can District Government and Water Basin Offices Contribute to
Participation, Accountability and Sustainability in Irrigation Schemes?

C. How can Donors Foster Participation, Accountability and
Sustainability in Irrigation Schemes?

3:30-5:00 Small Group Reports and Plenary Discussion

5:00-5:30 Lessons from the Workshop: Implications for Policy --Professor Wangwe

II. Workshop Recommendations

1. Recommendations for the Irrigation Section, MAC (or Irrigation Agency)

How can the Irrigation Section (or Agency) promote participation, accountability, and sustainable schemes?

Group One

1. Awareness Campaigns: These are crucial and should involve beneficiaries and leaders in potential project areas.
2. Gender Balance and Participatory Planning: In all activities, gender balance should be advocated and villagers should be involved in all phases of scheme development.
3. Irrigators' Associations: Efforts should be made to establish and/or strengthen irrigators' groups before projects are designed.
4. Farmer Training: All farmers should be educated on the objectives and goals of the intended activities and on their obligations with regard to irrigation activities. Training should be in the form of seminars, study tours, and classroom training.
5. Scheme Operation and Management: Funds solicited from farmers' contributions should be used solely for the purpose of scheme operations and maintenance. Sources of these funds include water user fees, fines (imposed for violations of by-laws), and irrigators group membership fees.
6. District Staffing of Irrigation Schemes: Each scheme has to be served by an irrigation technician, agricultural extension officer, and community development officer. Whenever possible, a multi-disciplinary team comprised of different professional disciplines should offer services to the scheme.
7. Environment: Environmental awareness training should be conducted for district officers and farmers.

Group Two

1. The Irrigation Section (Agency) should not carry out rehabilitation activities itself, but should take a facilitating role.
2. Implementation should be done by the irrigating community, assisted technically and financially by different government agencies, including the village government, district government, and the Ministry of Agriculture Irrigation Section.
3. If contractors are engaged, they should be accountable to the villagers/beneficiaries. There should be legal contract agreements between the contractor and the Village Government or Irrigators' Association and between the Government and the Village.
4. Requests from farmers in matters of design should be given top priority.
5. Sustainability requires the following types of training for irrigators:
 - operating and maintaining the scheme
 - leadership and management
 - financial management, bookkeeping, financial planning, etc.

Group Three

1. More effort is needed on awareness creation for beneficiaries before projects are undertaken.

2. Participatory approaches with gender mainstreaming should be used during project identification, preparation, planning, design and implementation.
3. Project design must take into consideration the financial, socio-economic, cultural and environmental situation of the community in which the project will be developed.
4. Financial transparency must be continuous, including the provision of clear contracts and agreements, copies of which should be given to beneficiaries.
5. There should be a clear definition of financial and other roles for all parties involved in irrigation projects.
6. Legal contracts between communities and other parties should be encouraged to enable all parties to seek legal recourse if needed.
7. Service or maintenance contracts should be utilized.
8. Financing for projects may involve fees for: consultant services, maintenance services, supervisory services. These could be derived from government subsidies and/or donor contributions to the Irrigation Agency.
9. Capacity building for human resources should be pursued at all levels, with an emphasis on the district and community level.
10. Funding for training should be provided by Water Users Associations, local savings and credit groups, District Councils, NGOs, and donors. District Councils should create special funds to be used exclusively for training

2. Recommendations for District Governments and Water Basin Offices

How can district government and water basin offices contribute to participation, accountability and sustainability in irrigation schemes?

Group One:

1. District Governments (DGs) and Water Basin Offices (WBOs) should provide funding for irrigators' organizations.
2. DGs and WBOs should create awareness on water related issues for communities.
3. DGs and WBOs should provide training for irrigators.
4. DGs should provide legal assistance to irrigators' organizations.

Group Two:

1. District government should plan for financial assistance to irrigation schemes, especially for training and technical support from district teams (irrigation technicians, agricultural extension and community development officers). Some of the funds for these activities should come from crop levies collected from the schemes.
2. District and Water Basin staff also require training in participatory methods, organizational development (e.g. differences between cooperatives and associations in the context of irrigation development, leadership training skills, financial planning training) and in technical matters related to irrigated agriculture.

Group Three

1. District officers should be involved from the earliest stages of project start up by assigning staff such as the community development officer, the cooperative officer and the irrigation technician at district level to the project.

2. Districts should register and help enforce village by-laws.
3. District councils should contribute financially toward training and other irrigation development needs.
4. Districts should encourage all water users to participate in planning of their water needs before approving projects.
5. Districts should promote and support the formation of water users groups that would also involve non-irrigators.
6. Districts should support community self-monitoring and evaluation processes whereby the farmers will be assisted by the village executive officer, irrigation technicians and community development officers in collecting and analyzing data.

3. Recommendations for Donors

How can donors foster participation, accountability and sustainability in irrigation schemes?

Group One:

1. Ample time should be available for awareness campaigns and capacity building activities among irrigators before projects are fully designed.
2. Phasing out of donor assistance should be gradual in order to allow irrigators to take over the operation and maintenance of their schemes more efficiently.
3. Donors should be flexible if governments are unable to contribute counterpart funds.

Group Two:

1. Donors should assure that information regarding the level of assistance for different schemes should be available to the public at the Irrigation Section/Agency (central government level) and at the Zonal Irrigation Offices.
2. Donors should assure that accountability is developed through the use of contracts where all parties (including irrigating communities) are aware of all conditions and requirements, even if they are not parties to the contract.

Group Three:

1. Donor funding should concentrate on capacity building issues.
2. Donors should participate in monitoring and evaluation of planning and implementation of the irrigation rehabilitation projects they fund.
3. Donors should provide technical assistance in relevant areas.

ENDNOTES

ⁱ The better known literature on the effects of participation in irrigation projects includes Lam 1998, and Uphoff 1992, based on Asian experiences. For preliminary evidence for Tanzania, see FAO/IFAD Cooperative Programme, 1998a, 1998b.

ⁱⁱ The core research team had four members: Professor Sam Wangwe, economist and executive director of the Economic and Social Research Foundation; Rhoda Kweka, soil scientist and gender specialist in the Irrigation Section, Dar es Salaam; Mary Mboya, sociologist with the Zonal Irrigation Unit and the Participatory Irrigation Development Programme in Dodoma; and Jeanne Koopman, economist and research fellow at the Boston University African Studies Center in the US. This team was ably assisted by Kenneth Petro, who served as an interpreter and village research trainer and by Pendo Deogratias, who assisted Mr. Petro during the second phase of the research.

ⁱⁱⁱ BASIS stands for Broadening Access and Strengthening Input Market Systems. Although the research grant was funded by USAID, the research itself was not commissioned by USAID. It was designed by the core research team to investigate issues of participation that have interested us for several years.

^{iv} The research team obtained this data from its review of Kikavu Chini's 1998 population census.

^v This estimate is based the KZIU's report to the research team that a total of \$667,000 had been spent at Kikavu Chini through March 2000. A 1998 evaluation of the project for the Norwegian Embassy reported that the estimated development costs for the rehabilitation as originally planned was \$4,800 per hectare. BACAS (Bureau for Agricultural Consultancy and Advisory Service, Sokoine University of Agriculture), *Review of Kikavu Chini Irrigation Project in Moshi: Final Report, May 1998, p. 47.*

^{vi} BACAS, 1998, p. 64.

^{vii} World Bank and IMF imposed structural adjustment programmes have stripped Tanzania of the power to subsidize inputs like fertilizer and pesticides. They have also forced the dismantling of national crop price stabilization schemes, exposing farmers to greatly increased price volatility with a high probability for severe downside price mobility when harvests are good.

^{viii} *Raphael* is the person who happens to own land near the breach in the canal. *Kwa Raphaeli* means at Raphael's place.

^{ix} Figures provided by the Kilimanjaro Zonal Irrigation Unit, February 2000

^x BACAS, 1998, p. 44.

^{xi} According to a 1993 report by KZIU staff, a cooperative registered in Kikavu Chini well before the formation of *Ukuku* had also been economically unviable. See Sizya *et al*, *Training Needs Assessment*, 1993, p.10.

^{xii} During the August 2000 Workshop on Community Participation in Irrigation (sponsored by this research project) several participants pointed out that the association model has legal and organizational features that are more appropriate for fledgling irrigators' groups than the cooperative model. The Ministry of Community Development's district and ward community development officers are experienced in helping irrigators form and register associations.

^{xiii} This changed somewhat during the course of the research workshop when the UNDP officer who had overseen the project suggested that villagers should attempt to tap an unrelated source of UNDP funds. These funds are, however, very small and could not solve the larger environmental problems. 25

^{xiv} Our population estimate is based on extensive population data from 1990 collected by Udo Prins, a student researcher from the Agricultural University of Wageningen in Holland who conducted a six month study in the Mtandika (Prins, 1992, appendix one).

^{xv} The cattle-keeping Maasai, who live together in one sub-village settled in the area in the 1970s and 1980s. They bought land along the river and took up farming. Some Maasai also still keep cattle. Their herds total about 3200, with 3 men owning 3000 head.

^{xvi} Mgambalenga accounts less than 40 percent of all irrigated land in Mtandika. A recent report by the agricultural extension agent estimates that some 295 hectares (730 acres) are irrigated with individual pumps. During our research, village leaders counted 42 pump owners in the village. This means that average holdings are 17 acres. Clearly pump irrigators are considerably richer than most plot holders in Mgambalenga, although many probably got their start in the scheme. Several of the larger pump irrigators are Maasai who purchased land along the Lukosi River in the 1970s and 1980s. (Data is from "Report on Research in Traditional Agricultural Practices and Knowledge at Mtandika Village" by M. Chilale and L. Mahena, September 1999)

Lack of time did not permit us to investigate this interesting phenomenon of private irrigation, but we do know that there are vast tracts of land along the Lukosi River that can potentially be irrigated. The Village Government is hoping that when electricity comes to the area, a large pump fed irrigation scheme can be created. Meanwhile, private farmers with pumps, both natives and outsiders, are rapidly taking up the land near the river.

^{xvii} Research notes, July 2000

^{xviii} By 1990 there were 20 pump irrigators with 2-5 acres each under cultivation (Prins, 1992, p 12). Today there are 42 with an average of 17 acres each.

^{xix} Research notes, March 2000

^{xx} A 1992 survey found that 120 landless men who were seeking irrigated plots. See Udo Prins, *Small-scale Irrigation in Mtandika and Ikula*, unpublished report for the Agricultural University of Wageningen and SNV/TIP, August 1992, pp. 50-1.

^{xxi} Prins, 1992, p. 50.

^{xxii} Research notes, March 6, 2000.

^{xxiii} Mtandika research notes, March 2000.

^{xxiv} Historically this has been a common cultural belief in Tanzania. See Sheridan, 2000.

^{xxv} Research notes, women leaders meeting, Mar. 6, 2000.

^{xxvi} Research notes, various meetings, March 2000.

^{xxvii} TIP's approach has been subsequently changed to place a much greater emphasis on conservation measures that must be taken before TIP will agree to contribute funds to rehabilitate an irrigation scheme.

^{xxviii} Interview with the former TIP manager, February 28, 2000.

^{xxix} Mtandika research notes, March 6, 2000.

^{xxx} These hopes were only recently dashed when the KZIU finally made it clear to the village that it has no money to complete the scheme as originally planned.

^{xxxi} KZIU Moshi research notes, Feb. 18, 2000.

^{xxxii} There is only female water distributor in the three villages involved in the research project. She reported that she does not find it difficult to allocate water to women during the morning hours.

^{xxxiii} It was not clear to the research team if this training was sponsored by the KZIU as part of the rehabilitation project or not.

^{xxxiv} The membership limit of five was established to facilitate applications for credit from micro-finance organizations and the district council. Some of the women's groups have received credit.

^{xxxv} Among the materials on gender training available at TIP's headquarters in Moshi are: Lucia Helsloot, *Training on Gender Issues*, 1992, and Winnie Bashagi *et al*, *Community Based Participatory Strategy for Gender Integration in TIP*, May 1994.

^{xxxvi} E.H. Masija, *Brief Review of Lessons on Community Participation in Irrigation*. Paper presented to the Workshop on Community Participation in Irrigation, ESRF, Dar es Salaam, August 10-11, p. 3.

^{xxxvii} Research notes, July 15, 2000.

^{xxxviii} Research notes, July 12-13, 2000.

^{xxxix} Research notes, July 12, 2000.

^{xl} One woman emphasized that, "You need your own land, so that when you die, your own family can get land." Research notes, July 12, 2000.

^{xli} We determined the change in real prices by asking respondents how many bags of maize it took to pay the rent before and after the rehabilitation. A 1993 report reported that renting land has long been highly profitable in Kikavu Chini. Rental prices at that time were 10,000 Tsh (\$15) for an acre of land suitable for maize and 30,000 Tsh. (\$50) for an acre suitable for rice. See M.J. Sizya, J.J. Temu and D. Mnzava, *Training Need Assessment Study for Water Users in Musa Mijanga and Kikavu Chini Rehabilitated Traditional Irrigation Schemes*. July 1993, p. 11.

^{xlii} Research notes, July, 2000. In 1992, the price for irrigated land in Kikavu Chini was \$750 an acre. BACAS, 1998, p. 32.

^{xliiii} If farmers in the traditional part of the Kikavu Chini scheme fail to pay water fees, it is not difficult for the water distributor to deny them water. This is apparently much more difficult to do in the newer part of the scheme.

^{xliv} On the other hand, most owners from the Landi area, especially those who live in the village, do help with the post rainy season task of removing mud and silt from the new main canal.

^{xlv} In Mtandika and Msosa, tenants are encouraged to join the water users associations.

^{xlvi} Village Land Act of 1998, Section 28. Sections of this act are reproduced in the National Land Use Planning Commission's *Guidelines for Participatory Village Land Use Management in Tanzania*, p. 139.

^{xlvii} The national poverty eradication strategy cites increased investment in smallholder irrigation schemes as a means of poverty alleviation. United Republic of Tanzania, *The National Poverty Eradication Strategy*, Vice-President's Office, 1998, p. 30.