GOVERNMENT OF ZANZIBAR
MINISTRY OF AGRICULTURE, NATIONAL RESOURCES, ENVIRONMENT AND COOPERATIVES

Department of Irrigation

Evaluation Report

Pemba Small Scale Irrigation Project
Consolidation Phase

7 - 21 January 2001

Rob Dingen
for

International Labour Organisation
&
European Union (STABEX funds)
ACKNOWLEDGEMENTS

The mission likes to express its appreciation to the Ministry of Agriculture, National Resources, Environment and Cooperatives (MAREC), for the support and organisation of the mission. Thanks also go to all government and project staff for their constructive participation during this assignment.

We are also grateful to all individuals from other Departments, NGO’s and UN agencies for their useful participation in discussions and for assisting the mission in information gathering and logistics.

We hope that the results from this mission will contribute to understanding the issues involved in small scale irrigation development on Pemba and that the lessons learned from the PSSIP will be taken on board in the design and implementation of future irrigation projects to achieve sustainable (irrigation) development.

It should be emphasised that the opinions expressed in this report are solely those of the mission and they do not necessarily reflect the views of the International Labour Organisation, the European Union or the Government of Zanzibar.

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Norg, 15 March 2001

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# Evaluation of PSSIP Consolidation Phase

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# ABBREVIATIONS

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<th>Description</th>
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<tbody>
<tr>
<td>AO</td>
<td>Area Office</td>
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<tr>
<td>ASIST</td>
<td>Advisory Support, Information Services, and Training</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<td>EU</td>
<td>European Union</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>FFW</td>
<td>Food for Work</td>
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<td>GoZ</td>
<td>Government of Zanzibar</td>
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<td>ILO</td>
<td>International Labour Organisation</td>
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<tr>
<td>IRF</td>
<td>Improved Rain-fed</td>
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<tr>
<td>LB</td>
<td>Labour-Based</td>
</tr>
<tr>
<td>MoALNR</td>
<td>Ministry of Agriculture, Livestock &amp; Natural Resources</td>
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<td>MAREC</td>
<td>Ministry of Agriculture, Natural Resources, Environment &amp; Cooperatives</td>
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<tr>
<td>O&amp;M</td>
<td>Operation and Maintenance</td>
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<td>PSSIP</td>
<td>Pemba Small Scale Irrigation Project</td>
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<tr>
<td>STABEX</td>
<td>Stabilized Export</td>
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<tr>
<td>TOR</td>
<td>Terms of Reference</td>
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<tr>
<td>Ts</td>
<td>Tanzanian Shillings</td>
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<tr>
<td>US$</td>
<td>United States Dollars</td>
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<td>WFP</td>
<td>World Food Programme</td>
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<td>WUA</td>
<td>Water Users Association</td>
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EXECUTIVE SUMMARY

Overall Appreciation

The project rationale (overall objective) is to create better living and working conditions of the rural population of the districts of Micheweni and Wete in Pemba, through improved incomes and food security, resulting from increased employment opportunities and intensified agriculture.

The project document for the Consolidation phase of the PSSIP lists the following outputs:
1. Ongoing irrigation and improved rain fed schemes completed (by use of labour based methods), consolidated and operational
2. Operation and maintenance procedures developed and put in place, including water user fees
3. Summarise findings and recommendations regarding lessons learned, in order to develop a resource base for future rural irrigation development in Zanzibar, including linkages with related organisations and programs

In general terms, the mission agrees with the assumption that realisation of operational small-scale irrigation schemes contribute to the development objective to make Zanzibar self sufficient in rice production. The project has illustrated that irrigated rice cultivation under good management practice can be economically beneficial to farmers and to the economy as a whole; increased production provides income or savings for individuals and has a positive impact on the foreign exchange balance of the Zanzibar‘ economy. The projects’ overall objective has thus been addressed.

The mission appreciates the achievements of this consolidation phase of the project. The physical progress made is commendable. Within the relatively short time span of one year, the infrastructure works have been completed as designed and planned, with the exception of some minor items.

The training outputs somewhat hampered effectiveness by the lack of spin-off from the training. This is due to i) the relatively short time span of this phase of the project, which effectively meant that training in O&M and farming techniques were shorter than required, ii) the fact that the emphasis and attention was geared toward the completion of the physical infrastructure, iii) the fact that effective training could only be conducted in the schemes with an operational irrigation system, and iv) the fact that the number of trainees reached in classroom training was rather limited by design.

The project produced a range of studies and research reports that reflect important issues involved in small scale irrigation development. The results of these studies contribute to best practice in irrigation development and the lessons learned are useful in future irrigation development on Zanzibar.
Main Findings

Construction activities
Although the project was set to commence in June 1999, delays in funds transfer hampered the start of the project. The start of the construction works was postponed for more than one month to August ‘99. Because of this delayed start and because the windows for construction are really only during the dry seasons, from July to October and from January to March, the work slipped a few months. By October 2000 most of the works were completed as per design standards and work schedule.

During the implementation of the project, it appeared that the labour-based methods were not as efficient as one might expect. There have been lengthy discussions on which productivity norms\(^1\) and task rates to adopt. A workshop to that effect resulted in acceptance of significantly higher productivity norms.

These productivity norms would be used in labour-based contracts with communities and local contractors. The anticipated development of community contracting however did not take place. Only at individual level, some work on structures was contracted out to specific members of the communities: artisans (masons, carpenters). The last progress report mentions that community contracting has not materialised, and that efforts to do so were too late to really take effect during this phase of the project. During the aforementioned workshop the participants (community members) expressed the wish to be more actively involved in the decision making process. They participants also expressed concern about the weakness of their own organisation as cooperatives and the unwillingness of the government to facilitate proper implementation of community contracts.

Agronomic activities
The project set up a number of testing plots to find out which varieties are performing best under different environmental conditions and management practice. The tests were done during both the Masika and the Vuli rainy seasons in Mangwena and Kinyakuzi. Trials in other schemes had not been possible due to the unavailability of irrigation water as the schemes were not completed yet. Although useful results have been recorded, this research still need to be continued in the future.

Farming demonstration plots
The project has selected a relatively small number of farmers to participate in training on farm management. The plots were managed under the guidance of project staff to demonstrate that good practice has a positive input on yields. The impact of the demonstration plots has been smaller than anticipated. No significant number of farmers copied the demonstrated practices. Furthermore, only farmers in Mangwena and Kinyakuzi could follow the example if they wished, as farmers in other schemes had no water yet to irrigate.

\(^1\)A productivity norm (or work norm) indicates the quantity of work a person will do on a day for which (s)he will receive a daily wage. On Pemba the adopted productivity norm was low resulting in labourers finishing their daily task in 3-4 hours and receiving a daily wage for that work.
Animation
The project assisted farmers with the official registration of their WUA under the Cooperative Act. This is of importance to the farmer groups in order to act as legal recognised bodies. There are however still unresolved issues. The legislation and endorsement of the By-laws for the WUAs has not yet been approved by the government of Zanzibar.

The project assisted the WUAs with the development and endorsement of operation and maintenance procedures including water user fees. Although much attention is given to these aspects, the procedures are not yet fully accepted nor adhered to. Training in O&M and participatory decision taking has not resulted in sustained practice. This is due to the fact that the beneficiaries have little confidence in the irrigation system and the rights of the WUA.

Studies
During the course of this consolidation year, a number of studies have been conducted. The studies had specific objectives and there was an overall goal: to draw lessons from the project for the future. The main findings and recommendations from these studies are discussed below.

Construction Design Backstopping Mission
An ILO backstopping mission in August/September 1999 made an inventory of all necessary construction activities for the consolidation phase of the project. The consultant further designed the structures and prepared a detailed bill of quantities and strategy on how to implement the works and a budget for the construction. This mission also produced Terms of References for consultancies in the field of gender, socio-economics and environmental impact.

Socio-Economic Study
This important study in relation to sustainability and effectiveness of the project was completed in draft in September 2000.

The study stressed the importance of good farm management and organisation of operation and maintenance, in which the WUA are to play a crucial role.

The study showed that irrigated rice cultivation is economically viable if the schemes are managed well. The findings however also pointed out that the organisation of the farmers and O&M practices of most schemes is not up to standard yet.

The study recommends increasing efforts in participatory organisation of the WUA in which the government has a supporting role.

Gender Impact Study
A methodical analysis of the gender issues involved in irrigation development was finalised by September 2000.
Executive Summary

The study recommends to improve access to extension services for women farmers, and to recruit more female extension officers.

Income generating activities and credit facilities are recommended to support women in their role of farmers.

A third important recommendation is to increase involvement of women in the decision taking process in the schemes and to ensure fair representation in the WUAs.

Environmental Impact Study

This recently completed study (draft report of November 2000) looked at the impact of traditional farming system and irrigated rice cultivation and the sustainable use of the natural resources and wildlife. The study gives recommendations on catchment protection and management practice related to fertilisation and pest control.

Training

Farmers Exchange Visits

Study tours were organised to the main land and to Unguja for in total 30 farmers and the project staff visited the Morogoro contractors training and irrigation sites in the Kilimanjaro Region.

Class room training

Several two days training sessions were conducted in Leadership and Management of WUAs, Member Capacity Building, Business Awareness Creation and Savings and Credits. The participants (between 20 and 25 per session) were (committee) members from the schemes in the project.

Workshop on community contracting

A three day workshop on community managed labour-based contracting was organised in April 2000. Participants were farmer representatives, private sector small contractors, Ministry staff, and project staff. The gist of the training was to establish (and agree upon) appropriate work norms.

Conclusions on project achievements

Effectiveness

The project has been effective in achieving the objective to finalise and consolidate the (physical) irrigation schemes, but less effective in instilling a operation and maintenance system that would guarantee sustainability.

Efficiency

The efficiency of project is evaluated positively. In a short time span of one year the project has managed to complete physical implementation and has conducted important studies that will assist the government and other stakeholder in preparing future irrigation development initiatives in Zanzibar.
Relevance
The project is relevant when looked at the policies of the government of Zanzibar; becoming self-sufficient in rice production and improving the livelihoods of the rural poor population.

Project Design
In general terms the project design has been logical and achievable. The investments in past had to be safeguarded by completing and rehabilitating the irrigation systems. The studies were appropriate; from these, lessons can be drawn for future development.

The training requirements were perhaps underestimated. The training input could have been more intensive and the time frame of the project could have allowed a longer post construction period for on the job training in O&M.

Project Performance
The performance of the project related to sustainability is lower than anticipated. Consolidation of sustainable irrigation schemes requires more training and guidance inputs than has been delivered.

An unanticipated effect has been the consequence of the unresolved issues surrounding the land tenure act and the legislation of the WUAs. This had a negative impact on the willingness of farmers to invest in the schemes.

Lessons Learned
The change from a government-regulated environment towards a privatised free-market setting has implications in terms of the role the department is to fulfil. Coming from a situation were implementation and management in the hands of the department, and extension services were perhaps of secondary importance, now the government is expected to create the environment in which farmers can run their own schemes. The implication of this is that the focus of government staff will need to shift from overseer and implementer to facilitator and service provider. Technical assistance will need to be tailor made and advise should address specific needs of the WUAs.

Sustainability of small scale farmer managed irrigation projects lies in the willingness and ability of the farmer groups -the Water Users Associations- to operate and maintain their schemes. This will only happen if the farmers are convinced that the scheme is theirs and their rights are safeguarded. The endorsement of the By-laws for the WUAs will be a good step forward.

Physical construction of an irrigation scheme should be part of a process in which the organisation and participation of the farmer groups are most important. The first objective of small-scale irrigation development should be to create a strong beneficiary organisation. Only when this is done, the development of a sustainable irrigation scheme can be realised.
Executive Summary

Recommendations

Follow-up in sustaining the project’s results
Although the physical implementation of the project is completed, the project will only sustain (and consolidate) when the WUAs are able to operate and maintain their schemes by themselves, which is currently in most schemes not yet the case. The consequence of this is that the project needs a proper follow-up in Operation and Maintenance as to protect the investment of the inputs.

The mission therefore recommends that a new project be set up (for and in all five schemes) that will:

✓ Train water users in the operation and maintenance of their schemes; the skills and knowledge should be transferred to the WUAs during on-the-job training over a longer period.
✓ Train the Committees of the WUAs in management of the schemes: Water management, financial management, administrative management and impact monitoring.
✓ Train government personnel, like community organisers and extension officers, in the aspects mentioned under the above bullet points, to enable them to advise and give guidance to the WUAs now and in the future.
✓ “Use” the project as a training ground for government staff to gain experience and knowledge that can be used in similar projects in the future.

The project would solely be a Small Scale Irrigation Training & Support Project, and would not include capital funding for rehabilitation or construction, as this would undermine the need for the WUAs to be pro-active. However, a possible credit scheme could be put in place to initiate revolving funds for operation and maintenance.

Recommendations for the future
✓ Labour based construction is recommended because this approach is appropriate in the small valleys of the island, it is economically beneficial and because it will build capacity among the farmers in maintaining the system, especially if the construction is implemented through community contracts.
✓ Trained extension officers (mentioned under the follow-up project) can be deployed as trainers in future irrigation development programmes.
✓ Strong emphasis is to be put on organisation and management of farmer groups in WUAs and committees.
✓ A recommended sequence in implementing similar farmer managed systems is to start with the organisation and defining priorities with and by the farmers of an area. Only after the farmers are organised and registered as an association, the government should start with assisting in physical implementation.
✓ From the first initiatives in the development planning cycle of a scheme, a participatory monitoring (see main report) system should be set up. This will assist the beneficiaries to monitor and assess the impact of project activities and it helps to manage the project.
1 INTRODUCTION

1.1 Content and Structure of the report

The structure of this report will follow the ILO guideline for evaluation reports. This introduction (Chapter 1) explains the history and the background and describes the objectives, inputs and outputs of the project. The second chapter will go into the findings of the evaluation and discusses the project activities and its achievements. The final chapter will summarise the conclusions and give recommendations on a follow-up and issues to consider for wider replication in irrigation development on the island.

1.2 Background and History

The Zanzibar economy is largely depending on agriculture; Over 65% of the GDP is income from agricultural activities and it is by large the greatest foreign exchange earner: 90%. More than 2/3rd of the total population work in the agricultural sector, directly or indirectly. Export earnings come from cloves and, to a lesser extent, from coconut products.

Production of cloves and coconuts has declined continuously since the late 1950’s and the export volumes of these crops and their by-products have therefore reduced drastically. Downward trends in the local output and the world prices for the commodity, which have persisted in recent years, have had an adverse effect on the Zanzibar economy. There is an excess of supply over demand which affect trading conditions negatively. Against these reduced prospects to earn foreign exchange, Zanzibar imports of such basic commodities as food, staples and textiles are steadily increasing.

The need to import food, purchased on the world market is substantial. Between 1975 and 1982 food import comprised between 20% and 50% of total imports. Rice imports alone increased by about 400 % over this period. Production of paddy on Zanzibar is insufficient to cater for the demand. Zanzibar’s agriculture depends largely on rain-fed production. Food production is mainly small scale with the major crops being rice, cassava, banana, sweet potatoes, yams, beans and vegetables. Except for rice, all are grown in intercropped or mixed systems, often in very complex associations under tree crops. Presently some 9000 ha of heavy soils are planted to rain-fed rice. Just over 3000 ha of this total is mechanically prepared. It is estimated that some 60% of the total cultivated area is devoted to food crops.

The comprehensive nature of Zanzibar’s current agricultural policy reflects the Government’s awareness of the fact that domestic food crop and export crop sub-sectors

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2 Information is used from project documents, the Zanzibar Irrigation Development Programme and the Agriculture Sector Policy Document (draft)
cannot be treated separately. For this reason the GoZ has formulated a broad based agricultural policy designed to achieve an economically efficient balance between export production and import substitution. The main thrust of the crop programme to date has concerned attempts to attain self-sufficiency in rice, cassava, sweet potatoes and bananas, with emphasis on increased paddy production.

The demand for rice in Zanzibar is far greater than the local production. Most rice now consumed on the islands is imported. When the cost of imported food rose abruptly and negatively in relation to export income (as a result of worldwide inflation and falling prices of exported commodities), the need to reduce dependence upon imports became an important priority. The Government of Zanzibar thus embarked on an examination of the possibilities for reducing the food production deficit with particular reference to the large requirement for imported rice. In 1986 the GoZ started to implement an economic recovery plan based on the rehabilitation of badly deteriorated sectors of the economy. Agriculture and Livestock were priority areas within this initiative. An important focus point was to improve the country's internal and external financial position through diversification of the economy, increased productivity and elimination of food shortages.

Several initiatives were started to improve production of rice and other crops, in which irrigation was a key means to achieve this. Although traditionally rice cropping is done on the islands, this is done by using simple water harvesting techniques: construction of bunds to collect rainwater to be guided to the fields during the rainy season. Land levelling or using canals to convey water to the fields was not practiced. Although already in 1955 some pilot schemes in irrigation development were initiated by the Ministry of Agriculture, only limited activities were initiated since then. In 1975, a project was started with assistance from the FAO project. Initially the project started with an inventory of the natural resources and with agronomic research. This developed into a programme to develop irrigation for the production of rice. On Pemba, work started in 6 valleys by using spring and seepage water to irrigate farm plots. Development was slow and the success rate rather low, due to the unfamiliarity of the farmers with irrigation techniques and on-farm management.

1.3 The Pemba Small Scale Irrigation Project

The first phase of the Pemba Small Scale Irrigation Project (PSSIP) started in 1987 in the northern region of Pemba by the GOZ with investment related financial support from the EEC and technical assistance, carried by the ILO, funded by the UNDP. The WFP contributed in the form of food incentives. The irrigation schemes were constructed in narrow valleys based on gravity water supply and labour based construction work. The project was initiated to (i) decrease the rate of under- and unemployment in the rural areas of Micheweni and Wete districts and (ii) to improve the income distribution of the rural workers due to an increase in the incomes of the poorest groups.
An internal review of the first phase of the project resulted in the formulation of a second phase of the project that started in 1991. The funding arrangement of this project phase was similar to the first phase with additional inputs from the EEC in funding technical assistance. The accent of this phase was put on reinforcement of the institutional basis at government and farmers level with a view to creating sustainable farmer-managed irrigation schemes. The focus was to create an environment in which farmers could manage their own projects and this involved participation of the farmers in all stages of the implementation. In 1993 the project ended. Both project stages (1987-1993) were evaluated in August 1993\(^3\).

The evaluation of the project was positive and the mission recommended continuing the project activities in a third phase, which affirmed strong requests received from the Government of Zanzibar. The EU appraised the proposal for extension and committed itself for additional funds of US$ 291,000 to enable the project to operate until 31 August 1995.

The actual start of this transitional phase was delayed until February 1994. The activities of this phase included completion of the irrigation schemes, registration of two WUA as co-operatives and the compilation of a project document from a Rapid Rural Appraisal which was conducted to assess the possibilities for future irrigation development in Pemba.

During the transition phase it became clear that a more holistic approach should be followed in preparing for the development of irrigation for Pemba Island. For this reason a proposal (May 1995) was prepared for a consolidation phase, financed with STABEX funds. The objective of this phase was to finish all remaining activities from earlier phases and to draw lessons from the project to serve as a basis for future development of (labour intensive) small scale irrigation on Zanzibar. The approval procedure for the use of STABEX funds was delayed and the project activities were suspended in September 1995 awaiting final approval of the funds to an amount of ECU 190,000. This materialised in 1999 and the project commenced in July of that year.

The outputs of the consolidation phase are:

(i) Ongoing irrigation and improved rain-fed schemes completed (by use of labour based methods), consolidated and operational;
(ii) Operation and maintenance procedures developed and put in place, including water user fees;
(iii) Summarise findings and recommendations regarding lessons learned, in order to develop a resource base for future irrigation development in Zanzibar, including linkages with related organisations and programs

\(^3\) Project evaluation Pemba Small Scale Irrigation Project, Main report, M. van Imschoot et al, September 1993
The outputs are further defined by activities:

I. Construction works (with use of LB methods):
   - Rehabilitation of damaged structures in the Saninga, Kinyakuzi and Mangwena schemes
   - Completion of irrigation infrastructure in Mipopooni IRF, Kwalempoon and Saninga schemes
   - Construction of canal lining

II. Agronomic activities:
   - Training on improved rice cultivation techniques (rainfed and irrigated) through inter and intra scheme exchange visits and demonstration plots
   - Research on most suitable rice varieties for Pemba
   - Seed multiplication
   - Awareness creation on integrated catchment approach

III. Animation activities:
   - Assisting farmers with the official registration of their WUA
   - Assisting the WUAs with improving their access to and control over their schemes
   - Develop and put in place operation and maintenance procedures including water user fees
   - Mobilisation of WUA where construction activities will take place

IV. Consultancies:
   - Environmental impact study report with guidelines for future sustainable irrigation development.
   - Socio-economic impact study towards the impact of the project on the socio-economic situation of the beneficiaries.
   - Gender impact evaluation of the activities of PSSIP
   - External audit of project funds

V. Training:
   - Training for farmers of the irrigation/improved rain-fed schemes trained on innovative agricultural cultivation practices, irrigation water management through training and inter and intra scheme exchange visits.
   - Exchange visit for 20 PSSIP farmers to FAO irrigation schemes in Unguja
   - Study tour for 10 farmers from PSSIP schemes to Tanzania Mainland irrigation schemes.
   - Study tour for project staff on Labour Based (LB) methods, e.g. to the Morogoro petty contractors training and LB project sites.

VI. Final project document with lessons learned and design criteria for irrigation development on Zanzibar.
1.4 The Objectives of the Evaluation

The evaluation mission, of which this report is the result, has been part of the overall work plan for the Consolidation Phase of the Pemba Small Scale Irrigation Project (PSSIP). One of the specific activities in the design of the project was to review the project in terms of appropriateness of the approach in the implementation of small-scale irrigation projects. From this, lessons learned are to be extracted and recommendations to be given to that extent that it will contribute to conclude on best practice in sustainable irrigation development.

The Terms of Reference for the evaluation (Annex III) talks about the above as one of the outputs of the mission. The evaluation therefore concentrated on two main issues:

1. Evaluation of the Consolidation Phase with conclusions on progress and recommendations on follow up.

2. Lessons learned and recommendations on wider replication and implementation of small scale irrigation development on Pemba.
2 FINDINGS

The design of the project outputs and activities are described in Chapter 1 above. This chapter will discuss the activities and the outputs in terms of progress both in quantitative and qualitative sense. Paragraph 2.1 will discuss the progress and content of the outputs and activities as implemented during this phase. Paragraph 2.2 will analyse the achievements of the project; how relevant is the project and how effective and efficient was its implementation?

2.1 Discussion of Project Activities

Roughly, the project activities can be divided into three distinctive groups of outputs:
- Construction Works
- Study and Research
- Training

The sub-paragraphs below will examine the progress achieved in these outputs.

2.1.1 Construction works

Although the project was set to commence in June 1999, delays in funds transfer hampered the start of the project. The start of the construction works was postponed for more than one month to August ‘99. Because of this delayed start and because the windows for construction are really only during the dry seasons, from July to October and from January to March, the work slipped a few months. By October 2000 most of the works were completed as per design standards and work schedule:

**Scheme: Mipopooni**

<table>
<thead>
<tr>
<th>Planned Activity</th>
<th>Quantity</th>
<th>Remarks</th>
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<tr>
<td>Flood drain excavation along the access road</td>
<td>750 m</td>
<td>Revision: excavate drain on both sides of the road, hence 1500 m completed</td>
</tr>
<tr>
<td>Access Road rehabilitation</td>
<td>750 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of a drift</td>
<td>1</td>
<td>Culvert instead of drift, upon request by farmers</td>
</tr>
<tr>
<td>Construction of culverts</td>
<td>3</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of a drop structure</td>
<td>1</td>
<td>No need; decision taken not to construct</td>
</tr>
</tbody>
</table>

The road from the main road to the scheme has been rehabilitated by the project upon request by the farmers. This improved access on foot, by oxcart and for tractors.

**Scheme: Mangweni**

<table>
<thead>
<tr>
<th>Planned Activity</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of culvert protection</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Flood drain excavation</td>
<td>400 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Repair of irrigation canal</td>
<td>160 m</td>
<td>Decided to be undertaken by the farmers themselves</td>
</tr>
<tr>
<td>Construction of under-crossing</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of foot bridge</td>
<td>3</td>
<td>Completed</td>
</tr>
<tr>
<td>Cross drain excavation</td>
<td>100 m</td>
<td>Completed</td>
</tr>
</tbody>
</table>
A drop in the lined canal collapsed recently (see Annex V) due to under-scouring of the structure. Constructing a drainage ditch in the plot next to the canal will prevent occurrence in the future. Proper backfilling of the lined canal section will also need to be done, especially near the off-takes to the plots.

During the construction activities in the scheme, much attention was given to awareness creation on maintenance work. The WUA organised work gangs to clear the canal and the storage reservoir near the intake. The farmers complained about shortages of water and recognised the need for regular desilting of the storage reservoir. However, only a few months later the reservoir is totally silted up and no attempts are made to clean it.

**Scheme: Saninga**

<table>
<thead>
<tr>
<th>Planned Activity</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of spillway</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Central drain rehabilitation</td>
<td>1200 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of canal lining</td>
<td>420 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of intake</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of culvert</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of under-crossing</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of drop structures</td>
<td>3</td>
<td>Completed</td>
</tr>
<tr>
<td>Excavation of irrigation canal</td>
<td>300 m</td>
<td>Completed</td>
</tr>
</tbody>
</table>

Although the spillway is newly constructed, the farmers do not trust the structure will last long. The heavy Masika seasons floods had washed away previous structures.

The intake of the canal is also new, but is missing bank protection (see Annex V), which could form a risk of scouring and eventually causing the intake to collapse.

The diversion of the canal to part B of the Command Area is constructed rather awkwardly; the canal diverts under a sharp angle. The dimensions of the canals are equally designed and based on rotational flow. However, the diversion point does not include stop-logs or a crest. The mission recommends providing stop-logs in order to make it possible to divert the water.

**Scheme: Kinyakuzi**

<table>
<thead>
<tr>
<th>Planned Activity</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of a bridge</td>
<td>1</td>
<td>Funds were not sufficient to realise this</td>
</tr>
<tr>
<td>Flood drain excavation</td>
<td>300 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Repair of an aqueduct</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of turnouts</td>
<td>5</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of foot bridge</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Central drain excavation</td>
<td>1000 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Rehabilitation of an orifice</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Finalise new structure near orifice</td>
<td>1</td>
<td>Spillway wall constructed, backfilling done</td>
</tr>
<tr>
<td>Canal lining</td>
<td>160 m</td>
<td>Completed</td>
</tr>
</tbody>
</table>
Findings

Scheme: Kwalempona

<table>
<thead>
<tr>
<th>Planned Activity</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair of Spillway No 2</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of Intake No 2</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Excavation of irrigation canal</td>
<td>1300 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Rehabilitation of Spillway No 4</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of approach canal</td>
<td>60 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of under-crossing</td>
<td>1</td>
<td>Completed</td>
</tr>
<tr>
<td>Construction of drop structures</td>
<td>3</td>
<td>Completed</td>
</tr>
<tr>
<td>Under crossing rehabilitation</td>
<td>3</td>
<td>Completed</td>
</tr>
<tr>
<td>Excavation of irrigation canal and right bank of flood drain</td>
<td>500 m</td>
<td>Completed</td>
</tr>
<tr>
<td>Central drain rehabilitation</td>
<td>1000 m</td>
<td>Completed late with farmers’ input</td>
</tr>
<tr>
<td>Construction of turnouts</td>
<td>7</td>
<td>Completed</td>
</tr>
</tbody>
</table>

The Socio-Economic study concluded: “Irrigation infrastructures in all rice schemes are not fully operational to enable farmers to carry out irrigation management practices as intended. Only the farmers in the Mangwena scheme are able to practise double cropping per year”. At the time of this study the construction works were not yet completed, hence results in operational schemes other than Mangwena have not been recorded. However, now that the majority of infrastructure problems have been solved, it is expected that the other schemes will benefit from irrigation again.

The items that remain are small improvements and extensions of the canal that were not foreseen in the original work plan. At the time of the conduct of the mentioned study the situation was such that farmers had not yet used the system since completion, or at that point in time the works were not completed yet.

The evaluation report of 1993 already mentions the appropriateness of labour based works in small scale irrigation development. Low costs labour based technology would create temporary employment during construction and maintenance.

During the implementation of the project, it appeared that the labour-based methods were not as efficient as one might expect. There have been lengthy discussions on which productivity norms and task rates to adopt. A workshop⁴ to that effect resulted in acceptance of significantly higher productivity norms.

These productivity norms would be used in labour based contracts with communities and local contractors. The anticipated development of community contracting however did not take place. Only at individual level some work on structures was contracted out to specific members of the communities: artisans (masons, carpenters). The last progress report mentions that community contracting has not materialised, and that efforts to do so were too late to really take effect during this phase of the project. During

the aforementioned workshop the participants (community members) expressed the wish to be more actively involved in the decision making process. They participants also expressed concern about the weakness of their own organisation as cooperatives and the unwillingness of the government to facilitate proper implementation of community contracts.

The above illustrates the problems that hamper efficient community contracting:

The farmer groups are not yet recognised as bodies that can operate as contractors
✓ The farmer groups still lack knowledge and experience to undertake work as contractors
✓ The Department of Irrigation still seems to be unconvinced community contracts are workable and fears losing control over quality insurance and work expenditures

2.1.2 Agronomic Activities

The activities planned under this heading were:
1. Research on most suitable rice varieties for Pemba
2. Seed multiplication
3. Awareness creation on integrated catchment approach
4. Training on improved rice cultivation techniques (rain-fed and irrigated) through inter and intra scheme exchange visits and demonstration plots

The project set up a number of testing plots to verify which varieties are performing best under different environmental conditions and management practice. The tests were done during both the Masika and the Vuli rainy seasons.

The research included:
- Testing of varieties under different fertilizer application (Mangwena and Kinyakuzi);
- Testing of Azolla application in relation to fertilisation and yield;
- Weed management-Yield trials in Mangwena and Kinyakuzi;
- General farm-management trial: different conditions and management practices to test which factor have significant impacts on yields. Results give recommendations on best practice in tilling and fertilising;
- Organic Manure Trials in Mangwena and Kinyakuzi;
- Variety (yield) performance trial on boggy soil in Saninga;
- Variety (yield) performance trial under rain-fed conditions in Mipopooni;
- Seed multiplication and -selection was included in the field demonstration trials

The results from these trials are summarised in two reports (Vuli '99 and Masika ‘00 seasons). There are clear recommendations on best practices and initial results on variety choice. Research in this field takes time, because the entire growing season has to be monitored. It is therefore not surprising, nor unexpected, that this research is not finalised yet and is to be continued in the future.
Most field trials were conducted in Mangwena and Kinyakazi. Only these schemes were able to irrigate at the time of the trials and the farmers in these schemes were most interested to participate in the research.

**Farmers Demonstration plots**
A relatively small number of farmers were selected to participate in the training: 10 farmers in Mangwena during the Vuli season and during the next (Masika) season again 5 from Mangwena and 5 from Kinyakazi were selected. The plots were managed under the guidance of project staff to demonstrate that good practice has a positive input on yields.

This point has certainly been proven (see also the Socio-Economic study); the farmers under training produced significantly more than their fellow members not included in the training. The project returned to these farmers after the second season to monitor what their post-training yields were. It was observed that the intensive guidance had resulted in better farm practice.

The impact of the demonstration plots has been disappointing. No significant number of farmers have been exposed to the demonstrated practices and results. Furthermore, only farmers in Mangwena and Kinyakazi could follow the example if they wished, as farmers in other schemes had no water yet to irrigate.

The conclusions from the above are, although the project has done what was planned:
- The impact has been small
- Training is only useful in a situation were knowledge can be put into practice immediately
- To achieve the training goals, intensive guidance and follow-up is required
- Visits and demonstration perhaps create awareness, but cannot replace intensive training.

Mangwena is the best working scheme in the project, it was this scheme that received most training. Farmers from other plots could visit the plots and learn from these demonstrations. The impact of these demonstration plots however has not been great. This is illustrated by the fact that there is no recording of farmers copying the farm management practices.

2.1.3 Animation Activities
The activities relevant to this heading are listed as:
- Assisting farmers with the official registration of their WUA
- Assisting the WUAs with improving their access to and control over their schemes
- Develop and put in place operation and maintenance procedures including water user fees
- Mobilisation of WUA
Although some of the schemes were registered as Associations under the Cooperative Act already before the Consolidation phase started, the project now has all four irrigation schemes registered as. Two schemes have a bank account.

Despite the energy and time that has been put into O&M training and participatory decision taking, little confidence is instilled to enable the Water User Committees and the members to operate and maintain the scheme effectively; after the input given by the project team was stopped, the WUAs could not sustain the momentum to continue good practice. In Saninga and Kwalempoona this is also due to the fact that these schemes only now have a system that is operational again.

The legislation and endorsement of the By-laws for the WUAs is now in the hands of the Government of Zanzibar. Now the proposal is awaiting advice and forwarding by the PS of MAREC, after which the draft will be discussed in the House of Representatives, which is expected to take place mid 2001.

2.1.4 Consultancies and Studies

During the course of this consolidation year, a number of studies have been conducted. The studies had specific objectives and there was an overall goal: to draw lessons from the project for the future. The main findings and recommendations from these studies are discussed below.

Construction Design Backstopping Mission
An external consultant, Mr. Marc de Bel, conducted a backstopping mission in August/September 1999 to make an inventory of all necessary construction activities for the consolidation phase of the project. The consultant further designed the structures and prepared a detailed bill of quantities, an implementation plan and a budget for the construction. His second task was to establish the Terms of References for consultancies in the field of gender, socio-economics and environmental impact.

This mission was successful and enhanced the momentum of the project. It focussed the project staff on the issues on hand and set priorities in the work plan.

Socio-Economic Study
At the time of writing this report the final version of the study is being compiled. The draft version was completed in September 2000. The study resulted into an elaborate report on the sustainability and effectiveness of project interventions under the PSSIP.

The study looked at the five schemes under implementation and has provided insight in: (i) the labour requirements under different cultivation regimes, (ii) income generation from the improved cultivation practices, (iii) benefits and constrains of the project schemes, (iv) development potential for irrigated/IRF rice cultivation and (v) income and food security from irrigation and improved rain-fed schemes.
**Findings**

*SOFIE finds were:*

- Farmers in all rice schemes own small portions of land. The majority of landholdings vary between 0.05 to 1.2 ha per household. In general, landholding under rice cultivation ranges from 0.3 to 0.5 ha. Irrigated rice ranged from 0.05 to 0.2 ha per household.

- Farmers at Mangwena rice scheme realised a yield of 5.4 tons/ha per year (double cropping) under farmer management.

- Irrigated rice under farmers management with recommended practices (demonstration plots) gives higher yield of 4.2 tons/ha per season compared to irrigated rice under farmer management alone (2.1 tons/ha per season) with a possibility to cultivate two seasons per year. The traditional rice production (rain-fed) gave the lowest yield of 1.2 tons/ha per year.

- Irrigated rice under farmers and researchers management (demonstration plots) gave high gross margin (income) of the Masika season of about 440,000 TS/ha, compared to 110,000 TS/ha obtained from traditional rain-fed rice production system. Irrigated rice under farmers’ management gave an average of 200,000 TS/ha/season.

- Irrigated rice production systems efficiently used farmers’ scarce resource compared to rain-fed rice production systems

- Only farmers in Mangwena are reasonably well organised and have a functional WUA and Committee. In other Schemes, the situation varies from a total ignorant and unorganised situation to starting to have some organisation structures in place.

- Farmers in all rice production schemes showed the willingness to contribute in cash or kind in O and M. Farmers are willing to contribute per person close to 3000 shilling per year for maintenance and 2500 shilling for operational costs.

- Problems encountered in farmers associations and water management were: lack of capital, knowledge and ability related to associations and operation and maintenance.

- Institutional problems in rice development include lack of seed research unit, lack of credit facilities, weak extension and training unit and lack of proper working tools.

*SOFIE recommendations from the Socio-Economic Study:*

- Farmers are to be involved in all stages of the project in implementing an irrigation scheme.

- Government is to support the WUAs with technical advise/support in construction and operation and maintenance.

- Organisation of farmers in WUA should be promoted and supported.

- Farmers saving and credits groups should be encouraged and supported.

- Promotion of Farmers who have capacity to cultivate bigger plots should be given access to it, as 0.1 ha is too small for economic viability.
**Gender Impact Study**

In order to obtain a better understanding of the position of women and their role in the irrigated rice cultivation, a gender study has been conducted and completed in September 1999.

The study is a methodical analysis of the environment in which especially female farmers try to sustain their livelihood. The study provides a good understanding of the issues involved.

The study had to make an inventory of the practical and the strategic needs of women in the (irrigated and improved rain fed) rice schemes.

The study specifically discussed:
- The characteristics of the present situation in the farmer household
- The gender based division of labour, on and off-farm.
- Possibilities for monetary income for women and men
- Quantification of typical male and female activities
- The gender differentiation of land ownership, rights on land and involvement in decision taking within the scheme and WUA.

An important recommendation of the study is to improve access to extension services for women farmers, to improve the balance between men and women; although women do most of the farming work, the targeting in extension is focussed on men. More female extension officers are to be recruited. This will familiarize women with respect to technical and institutional aspects of irrigation.

Another recommendation is to create specific income generating activities that support women in their role of farmers and provide credit facilities to, for example, purchase of appropriate means of transport and farm tools, as to reduce the work load. This would also require training in developing and maintaining these tools

More farm activities need to be shared between men and women equally. This includes involvement in decision taking in water management, operation and maintenance and fair representation in the WUA.

**Environmental Impact Study**

This recently completed study (draft report of November 2000) sums up the impact of project activities on the environment and highlights issues to be taken into account when introducing development activities such as by the PSSIP.

The study looked at the impact of traditional farming system and irrigated rice cultivation and the sustainable use of the natural resources and wildlife, and found that there are risks involved related to catchment degradation and soil and water conditions that will have to be addressed in future projects by taking protection measures and through sensible management practice.
Findings

The consultant assessed the water-borne and water-based diseases and found that there is an increased risk of contracting Bilharzia as well as other gastro-enteric infections in areas that are developed under irrigation. Although there is an increase in Malaria cases over the last years, there is no direct correlation found between this increase and irrigation development.

Another important examined aspect was the application of agrochemicals in relation to the quality of irrigation water with regard to salinity, sodicity. The study found that there is confusion concerning the appropriate level of application of fertilisers and pesticides in rice cultivation. Due to the variations in soil and water conditions, the application ratio and type of additives should be discriminated. Now there is only one general application advice for all irrigation schemes, which could cause serious degradation of soil fertility and higher levels of mineral pollution of (ground) water sources.

The main Recommendations of the study regarding environmental aspects were:

- To instil integrated soil conservation measures to enable farmers to sustain the schemes.
- Regular monitoring of soil and water conditions as to detect any changes that may occur due to continuous application of agrochemicals so as to avoid surface and ground water contamination, and appropriate application advice.
- Long-term proposed measures have to be put in place in order to ensure sustainability of the existing schemes with minimum damage to the environment.

Training Needs Assessment for Water User Associations

The objective of this assignment was to identify training needs, through establishment of current gaps, and to propose a training program to fill the identified gaps. The report -finalised in September 1999- discusses the strengths and weaknesses of the current WUA’s in managing their irrigation schemes. The report describes outcomes from the Training Needs Assessment, and sets out a training programme for the members of the WUA’s.

The report ranks the different training needs as prioritised by the beneficiaries themselves:

- Highest priority is given to training in management and maintenance of water reservoirs and irrigation canals and in training in leadership skills and management of the WUA;
- The second priority is given to training in financial management;
- A third priority is given to capacity building in credit scheme management and in farming practice.

The training proposals reflect these priorities and are:

1. Leadership training and Association management
2. Financial control and record keeping
3. Members capacity building
4. Business creation awareness
5. Savings and credit management
6. Basic business management

These training courses are classroom set and the duration is 2 to 3 days

2.1.5 Training and Study Tours

Farmers Exchange Visits
In April 2000, the project organised a study tour to the mainland of Tanzania for 10 farmers and 5 field staff members. The aim was to exchange ideas and experiences with the field staff and farmers of the schemes visited. Several Smallholder labour-based Irrigation Schemes in Kilimanjaro Region were visited. Specifically O&M, water management, financial management and organisation aspects were looked at. The tour was evaluated as useful.

Class room training
Several training session were conducted by Mrs. Tarimo as identified in a training needs assessment earlier. The training topics were:
• Leadership and Management of WUAs
• Member Capacity Building
• Business Awareness Creation
• Savings and Credits
The number of participants varied between 20 and 25 per session. The participants were (committee) members from the schemes in the project. Each training session took two days. The participants felt the training was useful but too short. The training needs follow up in practical fieldwork. A full report is available.

Workshop on community contracting
In April 2000 Messrs D. Mason and Kasure conducted a three day workshop on community managed labour-based contracting. Participants were farmer representatives, private sector small contractors, Ministry staff, and project staff. Much attention was given to appropriate work norms. The workshop succeeded in reaching consensus on appropriate task rates for labour based works in the construction of irrigation schemes. The workshop was received as useful. A full report is available.

2.1.6 Terminal Report
The terminal report of the project has not yet been compiled. The report should include handing over procedures and lessons learned from the implementation of this phase of the project. Special attention need to be given to the labour based contracting experiences: How many contracts have been awarded and to whom, how many labour days were generated and which productivity norms have been used. The evaluation report can be made part of this final report.
2.2 Analysis of Project Achievements

2.2.1 Effectiveness

To what extent has the project achieved its objectives?

Assessing to what extent the project has been effective in achieving its objectives should be discussed from two angles:

1. (Immediate Objectives) Has the project been effective in achieving the objectives set for the consolidation phase of the project?
2. (Development Objective) Has the project been effective in employment generation and improved economic conditions for the rural poor?

In respect of 1):

The immediate objectives of this phase were to (i) consolidate and make operational the ongoing irrigation and improved rain-fed schemes and to (ii) develop and put in place operation and maintenance procedures, including water user fees and thirdly (iii) to draw lessons from the project to be used in future initiatives in small scale irrigation development.

The project constructed and rehabilitated the five schemes within a short time span, using labour based techniques. The mission is of the opinion that this has been a commendable achievement.

To consolidate the irrigation schemes and make them operational not only construction is required. To sustain the schemes, institutional and organisational capacities had to be strengthened as well. The means by which the project approached this, was through training and (participatory) animation and support.

Over the years of intervention in assisting the farmers in construction, field management, leadership training and especially in repairing broken down structures, little evidence exists that farmers are convinced of the necessity of maintenance and self-supporting. On the contrary, sometimes letting the system deteriorate has been rewarded by re-construction and often an overall improvement of the canal system.

Training of beneficiaries in farm practice and water management showed to be effective in reaching substantial yield increments. The number of farmers directly involved in the training has been limited. Training can only be effective if the beneficiaries can apply the newly gained knowledge immediately. Only in Mangwena and to a lesser extent in Kinyakuzi, this was the case. The irrigation systems in other schemes were not in operation yet. The anticipated spin-off from the demonstration practices has not been noticed.

The animation activities have been intensive and relevant in assuring a sustainable environment in which the schemes operate. However, some issues were not within the grip of the project. The land use rights and the rights for the WUAs to operate as a legal
body, are under revision and for consideration by the government. Without a clear understanding of these rights, members are reluctant to invest in their “own” system. Although the project has assisted in establishing water user fees in most schemes, these fees are still too low for sustained maintenance.

Training in leadership, WUA management and finance management of revolving funds for maintenance and agricultural input were too short and did not result in a change of practice. The Socio-Economic study supports this finding.

The project has been pro-active in ensuring that all relevant issues had been monitored and studied. The various consultancy reports do combine to an understanding the risks and benefits in development of small scale farmer managed irrigation schemes.

In summary, the issues recognised by the project as important to ensure sustainability of the schemes were relevant, but the effectiveness of training in these topics proved to be lower than anticipated.

**In respect of 2): the development objective**

From a farmer’s perspective, the benefit lies in increased food production. Economically, individual farmers will only be self sufficient in rice (production at level of consumption) if they cultivate 0.2 ha of irrigated rice under good management practice. Only above this subsistence level, farmers produce enough to sell surplus. Most farmers in the schemes cultivate (much) less than 0.2 ha and thus do not produce enough to gain a surplus. However, it must be said that most farming families (on average 6 persons) do have other plots with cash and other food crops to support their livelihood.

The economic analysis done in the Socio-Economic Study showed that in the irrigation schemes the return to labour improves significantly compared to traditional rice cultivation. Yields are substantially higher and contribute to self-sufficiency in rice for the island. Economic benefits are the savings in foreign exchange for rice imports. The economic viability is only then guaranteed when operation and maintenance practices are up to standard.

Although the project did not report on the benefits (quantified) of short term employment (by the use of labour-based methods), it is apparent that apart from the direct economic benefits, the sustainability of the project can be safeguarded by skill transfer to beneficiaries of the schemes, as this would enhance the probability of maintenance in the future.

**2.2.2 Efficiency**

*To what extent has the implementation of the project been efficient?*

At the start of this phase of the project, the schemes were not operational with the exception perhaps of Mangwena. Within a short time span the project realised
implementation of construction/rehabilitation of five schemes and facilitated a number of important studies that assist the government and other stakeholders in designing interventions in the future. The investment in this phase (of ECU 190,000) has resulted in the consolidation of 5 irrigation schemes and in valuable information (lessons learnt) that supports the government and donors to implement future projects effectively. The conclusion must therefore be that the investment made in this phase of the project has been efficient.

2.2.3 Relevance

How relevant are the objectives of the project?

As discussed in earlier paragraphs, the objectives are very relevant in terms of sustainability of small scale irrigation development. The objectives made possible that all schemes were brought into maintainable condition and that all the issues that relate to sustain schemes were catered for in the implementation of the project.

The relevance in broader perspective is also clear: the policies of the government of Zanzibar look at irrigation development in a privatised environment as one of the pillars on which the island can build self-sufficiency in rice production and develop economically. The immediate objectives contribute to the overall objective by providing the possibility to produce more rice than under traditional systems and saving foreign currency on import of rice.

2.2.4 Project Design

Is the project design logical and achievable?

The proposal for the consolidation phase talks about the rationale for the project: “The rationale for taking on irrigated rice production relates above all to higher returns for land and labour for the target group. This is achieved through higher and more reliable yields, improved incomes and food security, higher income from labour and thus reduced poverty. Moreover, intensifying agriculture appears a necessity within the context of population growth and increasing pressure on the restricted land resources of Pemba Island.”

In the subsistence agricultural economy of Pemba, where labour is abundant and cash is in short supply, a labour intensive production system of gravity irrigation is an important component of rural development for the following reasons:

• Absorption of the active un(der)employed population into a production system of double cropping under irrigation, instead of single cropping as in most rain-fed activities;
• Gradual integration of the subsistence farmers into the market economy;
• Agricultural production to keep pace with population growth and;
• Reduction of environmental degradation resulting from the pressure on the land resources from (traditional) rain-fed agriculture.
To answer the question if the project design is logical and achievable, one should look at the rationale, the outputs and the activities defined:

1. Do the activities capture the anticipated outputs and;
2. Do the outputs give justice to the rationale for the project?

The project was designed to contribute to counter-balance reduced income from the clove industry and had to cater for increased demand for rice on the island. The long-term goal is to attain self-sufficiency in domestic rice production. Higher and more reliable yields would lead to improved livelihoods of the targeted beneficiaries. The project was designed to accomplish this through the implementation of sustainable farmer managed irrigation schemes.

The first two outputs were appropriately chosen to achieve this goal:

1. Ongoing irrigation and improved rain-fed schemes completed (by use of labour based methods), consolidated and operational.
2. Operation and maintenance procedures developed and put in place, including water user fees.

International experience shows that the use of labour based methods has positive effects on local economies (by creating short term employment) and through involvement of beneficiary groups in the implementation of projects, skill transfer takes place which improves capacity at local level, forming the basis for sustainability in operation and maintenance of irrigation schemes.

Development of small-scale schemes in technical sense is relatively easy. However, as recognised by the project, sustaining these schemes (by maintaining the systems) and making the schemes economically viable requires a well-structured organisation of the farmers. The WUAs will need to adopt and carry a set of rules and procedures to operate and maintain the system.

The third output of this phase anticipated on wider replication and further development of small scale irrigation:

3. Summarise findings and recommendations regarding lessons learned, in order to develop a resource base for future rural irrigation development in Zanzibar, including linkages with related organisations and programs.

Both the Agricultural Policy and the Zanzibar Irrigation Development Programme of the GoZ see farmer managed irrigation development as an important step towards self-reliance and self-sufficiency in food production and economic development. Both documents also recognise that the risks involved relate to organisation and management of such schemes. Experiences and lessons learnt from the PSSIP are extremely valuable in the process of wider replication of similar irrigation development.
Findings

A final report is to be compiled with all final financial statements. Handing over procedures and lessons learnt should also be included.

**Design of the activities**

The proposal for extending the project into the consolidation phase mentions under the justification for the project: 

"Another reason is that at present the WUA are not yet sufficiently strong to manage the irrigation schemes without some assistance. Especially in the field of operation and maintenance training is needed in order to come to efficient operation procedures including a system of water user fees which should be made available to finance these activities."

The question here to answer is: **Was the design of these activities that were meant to achieve sustainability appropriate?** In other words, did the training inputs, the field visits and study tours had their anticipated effects? The answer to that question is, although the training outputs did improve the knowledge and ability of farmers to manage their own schemes, the anticipated impact of this has proven to be over-optimistic. This is mainly caused by reasons other than what can be corrected or improved by training alone and to a lesser extent by the limited number of people reached in the training.

As mentioned earlier and indeed recognised by all stakeholders in the project, farmers are unclear about land tenure issues and about the rights of the Water User Associations. As long as these uncertainties exist, farmers are reluctant to invest in their scheme.

The above makes clear that although training inputs are very important, the design of the project has somewhat failed in recognising the need to address these issues more effectively by spending more time on (on-the-job) training.

**2.2.5 Project Performance**

*Were there any unexpected effects on the performance of the project; would there be alternatives that could have improved effectiveness or efficiency?*  

Procedures in funds transfer delayed the swift start of construction activities and the backlog in work caused a slight overrun of the completion date. This however did not influence the performance of the project or the quality of the construction work.

As discussed under the previous headings (*Effectiveness* and *Design*), the performance of the project related to sustainability is lower than expected. More time and attention should have been allowed for effective training and guidance.

A clearly unanticipated effect has been the consequence of the unresolved issues surrounding the land tenure act and the legislation of the WUAs. This had a negative impact on the willingness of farmers to invest in the schemes.
3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

- Labour based construction is an appropriate approach in these small scale schemes. It creates employment for the people in and around the scheme and it enhances a sense of ownership of the scheme with the beneficiaries. In practical terms Labour Based work is also effective, as machines are difficult to deploy in the (swampy) valleys of Pemba and thirdly, labour is economically viable and cheaper than machines that need to be imported and maintained.

- Small-scale irrigation development fits the objectives to become self-sufficient in rice production and to improve the livelihoods of the rural poor population.

- The Socio-Economic Study shows that yields achieved are lower than was expected in earlier predictions. The evaluation report of the first two phases (‘87-'93) was in that respect too optimistic. However, now supported by evidence, yields from irrigated cultivation under proper management are 4 to 6 times higher than in traditional rice cultivation.

- Irrigated rice plots under recommended management practices (project assisted) give twice as high yields compared to irrigated under present farmer management alone. The overwhelming majority of the farmers however are not able to reach this yet. Proper Operation and Maintenance is evidently a crucial factor in the success of irrigated cultivation.

- In Improved Rain-fed schemes the yields can double, compared with traditional cultivation. The investments needed for improved rain-fed practices are, compared to irrigation systems, relatively low and although the economic returns under irrigated cultivation (under good management) are higher than under improved rain-fed, in situations where insufficient irrigation water can be guaranteed, improved rain-fed practices are recommendable.

- The economic returns from irrigated cultivation of rice under improved management are economically viable. The cost-benefit ratio shows a positive 1.6 compared to a negative 0.8 in traditional rice cultivation. The economic benefit is found in the foreign exchange savings of importing rice.

- From a farmer perspective, the economic benefit of irrigated rice cultivation relates to the savings made in not having to buy rice for consumption. An average family need at least to cultivate 0.2 ha under irrigation to reach parity: the yield is at subsistence level to feed the family of 6 persons.

- The project progress in physical construction in this last (consolidation) phase has been satisfactory; some minor works remain, but these can best be taken up by the farmer groups themselves.
Conclusions and Recommendations

- Training in O&M and in management and organisation of the WUAs are crucial in sustaining farmer managed irrigation schemes. Transfer of knowledge through vocational and formal training is just partly effective. More important is a long term support and guidance of the members and the committee of the WUAs.

- The changing role of the government is not to be underestimated. Proper training is required to guide this process. Skills in extension and community mobilising will became more important than it perhaps was before.

3.2 Lessons Learned

√ Sustainability of small scale farmer managed irrigation projects depends on the organisation and maintenance of the irrigation system. Operation practices, i.e. adherence to cropping calendar, application of inputs like fertiliser and pesticides and a well-maintained canal system, depend on the willingness and the ability of farmers to do so. It stands or falls with the strength of the WUA: the Committee and its members.

√ The sense of ownership is of vital importance and this relates directly to the rights of farmers on the land: farmland in the scheme should be considered as their own and not as “borrowed”. Land tenure is therefore an important issue that need to be regulated by law. The endorsement of the By-laws for the WUAs will be a good step forward.

√ The change from a government-regulated environment towards a privatised free-market setting has implications in terms of the role the department has to fulfil. Coming from a situation were execution and management was run by the department, and extension services were perhaps of secondary importance, now the government is expected to create the environment in which farmers can run their own schemes. The implication of this is that the focus of government staff will need to shift from overseer and implementer to facilitator and service provider. Technical assistance will need to be tailor made in addressing specific needs of the WUA’s.

√ Physical construction of a scheme should not be the first, but rather one of the last activities in a project. It should be part of a process whereby the organisation and participation of the beneficiaries plays a main role. The immediate objective of small-scale irrigation development should therefore be to build a strong farmer/beneficiaries organisation. The secondary objective will then be to develop a sustainable agricultural production scheme; the secondary objective will be achieved only if and after the immediate objective has been realised.
3.3 Recommendations

3.3.1 Follow-up

An immediate follow up should be:

Compilation of a Final Project Report. Possible contents of this report include (i) final progress report of the last 3 months of implementation, (ii) Financial statement at closure of the project, (iii) Overview of all reports and studies, to be used for interested parties and stakeholders (iv) Appropriate Labour Based design criteria and norms for small scale irrigation schemes (based on the norms and criteria tested in this phase of the project) and (v) Lessons learnt from the project (which can include this evaluation report).

The follow-up in sustaining the project’s results

Both the Irrigation Development Programme and the Agriculture Sector Policy refer to the importance of self-sustained agriculture activities that enhance economic stability and improve the livelihoods of the rural population. The government is to play a supporting role and is to create the environment in which privatised activities are enabled.

As mentioned earlier in this report, small scale irrigation development very much fit these objectives. To realise sustainable irrigation development within this environment, two issues need to be addressed:

- The capacity and ability of farmer (groups) to manage and operate their irrigation schemes successfully by themselves
- The capacity and ability of government institutions to support and guide the farmers in self-sustained irrigation development

The report of the Zanzibar Irrigation Development Programme explains in length that the sustainability of irrigation development relies on the clarity of the role and rights of farmers and the WUAs in relation to the responsibilities of government institutions. On page 15 the report says: “...But instead the situation has been worsened by several decades of controlled economic activity which has insidiously de-motivated the smallholder farmers who are used to expecting an unjustifiable and unsustainable level of intervention and support from the Zanzibar institutions which are inadequate anyway. Added to this is the unsatisfactory legal framework within which farmer or WUAs struggle for definition and role”.

The above is illustrative for the current situation. In a changing environment, where farmer groups have to shift from government guided agriculture to a privatised situation, the government is also to make a switch. From technicians and implementers to an organisation that facilitates and supports. The extension service will thus become more important.
Conclusions and Recommendations

The conclusions from the previous chapter lead to the understanding that, although the physical progress has been satisfactory and the means through which the infrastructure has been built are appropriate, the sustainability of the irrigation schemes can only then be guaranteed if and when the water users are able to operate and maintain their schemes by themselves.

When looked at schemes that have been supported in organisation, management, operation and maintenance over a longer time period (like Mangwena), the conclusion is that those schemes have a greater chance of sustaining irrigated agriculture. It is however also apparent that even Mangwena is not yet fully self-supporting. The implication of this is that the effectiveness of the project should be guarded as to prevent that the project activities have been in vain. This means that the sustainability is to be safeguarded by a proper follow-up in Operation and Maintenance. This is especially important in those schemes that are less conversant in O&M of irrigation schemes than Mangwena is.

The necessity to support the WUA and their members is evident. However, as long as there are donors and government that maintain the schemes for the beneficiaries, there is little hope that the WUA will organise their members in financing and implementing O&M themselves. The support therefore should concentrate on technical advice and on-the-job training in O&M.

The project has implemented the construction of five schemes. Only two of these schemes are somewhat experienced in irrigation management, but not yet performing well. The other schemes only have had short and interrupted experiences with irrigation and the “beneficiaries” in these schemes haven’t really learned how to operate and maintain an irrigation scheme yet.

Now the systems are brought back into maintainable condition one would hope to be able to consolidate this situation. In light of the above, it is however expected that unless proper follow up is provided, these schemes will probably be in dismay within two or three cultivation seasons and the investments made are prone to turn into losses. More importantly, the irrigation system now in place will challenge the beneficiaries to shift from their relatively safe cultivation practice to a more risky cultivation under irrigation. If operation and maintenance is not kept up, the system could fail to deliver sufficient irrigation water to the fields and result in no harvest at all.

The mission therefore recommends that a new project be set up (for and in all five schemes) that concentrates on the following:

- Train water users in the operation and maintenance of their schemes; the skills and knowledge should be transferred to the WUAs during on-the-job training over an extended period.
• Train the Committees of the WUAs in management of the schemes: Water management, financial management, administrative management and impact monitoring.

• Train government personnel, like community organisers and extension officers, in the aspects mentioned under the above bullet points, to enable them to advise and give guidance to the WUA’s now and in the future.

• “Use” the project as a training ground for government staff to gain experience and knowledge that can be used in similar projects in the future.

A “Short Project Outline” (SPROUT) has been developed during the time of the mission in consultation with the government, the project staff and ILO representatives. This project description has been drafted by ILO-ASIST and is presented in Annex VII.

The project would solely be a Small Scale Irrigation Training & Support Project, and would not include capital funding for rehabilitation or construction, as this would undermine the need for the WUAs to be pro-active. However, a possible credit scheme could be put in place to initiate revolving funds for operation and maintenance.

3.3.2 Recommendations for the future

The conclusions, recommendation and lessons learnt that have been described before are to be taken into consideration when initiating similar type of projects in the future.

To briefly sum up some of the recommendations that came out of the studies:

• Survey of new potential irrigation/improved rain-fed rice production in valleys following the Initial Rapid Rural Appraisals (to pre-select schemes), followed by more intensive participatory appraisals.
• WUA accepted by government
• By-laws for water management in place and reinforce-able
• Farmers are to be involved in all stages of the project in implementing an irrigation scheme.
• Government is to support the WUAs with technical advise/support in construction and operation and maintenance.
• Organisation of farmers in WUA should be promoted and supported.
• Farmers saving and credits groups should be encouraged and supported
• Promotion of Farmers who have capacity to cultivate bigger plots should be given access to it, as 0.1 ha is too small for economic viability
• Improve access to extension services for women farmers;
• Improve the role of women in the decision-making process in the WUA;
• Alleviate women’s workload by introducing appropriate farm tools and equal sharing of farm activities between men and women.
• Create awareness amongst the farmers in the schemes on environmental issues, related to catchment, causes of erosion, pollution and fertilisation.
Conclusions and Recommendations

• Improve cultural practices, use of organic fertilisers and use of natural pesticides
• Provide training on soil conservation measures, like slope protection and catchment protection.
• Continue with training and research in agronomy and farm management

In conclusion, the following can be recommended:

√ The training of extension officers mentioned under follow-up activities (previous paragraph) will benefit future irrigation development in the sense that these people can train future WUA members in sustainable management of irrigation schemes.

√ A period in which the government staff -involved in extension services in both farming practice and scheme management- is trained, will benefit implementation in the future: impact monitoring will assist the government to establish which practices work best to be applied in further irrigation development on the island.

√ Strong emphasis is to be put on organisation and management of farmer groups in WUAs and committees.

√ A recommended sequence in implementing similar farmer managed systems is to start with the organisation and defining priorities with and by the farmers of an area. Only after the farmers are organised and registered as an association, the government should start with assisting in physical implementation.

√ Even if a scheme has potential for irrigation development, work should start in development and improving rain-fed cultivation. Only when this proofs to be successful, the support should focus on irrigation development.

√ The use of labour based construction methods is recommended for three reasons: i) the appropriateness in the given terrain conditions, ii) The economic benefits and iii) in combination with community contracting, the capacity (skills development) building of the farmers to maintain and repair the system.

√ From the first initiatives in the development planning cycle of a scheme, a participatory monitoring (PIM)\(^5\) system should be set up. This will assist the beneficiaries to monitor and assess the impact of project activities and it helps to manage the project.

\(^5\) PIM (Participatory Impact Monitoring) is developed from the effective but very resource intensive ZOPP techniques. Recognising that in practice such planning systems not always work, a simplified and effective practical tool was developed. PIM is a process based monitoring tool that can be used by the beneficiaries and stakeholders to manage project(s). Recommended references: i) PIM: Selected reading examples (GTZ-Gate) internet: [www.niod.org/clic/Rdl84.htm](http://www.niod.org/clic/Rdl84.htm), ii) PIM; a new tool with high potentials –a Kenyan Experience, G. Noack and Lucas Wadenya, March 1998), iii) Tracking Change Together, a case study in Malawi, by Lisa van Dijk, 2000, email: lvandijk@malawi.net; iv) Specific M&E issues are discussed in: “Guide to Monitoring and Evaluation of Irrigation Management Transfer”, by D.L. Vermillion (JIID/INPIM, 2000), contact: the Japanese Institute for Irrigation and Drainage, email: icid@jiid.or.jp