AFRICAN DEVELOPMENT FUND

THE UNITED REPUBLIC OF TANZANIA

MADIBIRA SMALLHOLDER AGRICULTURAL DEVELOPMENT PROJECT

PROJECT COMPLETION REPORT

AGRICULTURE AND RURAL DEVELOPMENT DEPARTMENT **ONAR**
NORTH, EAST AND SOUTH REGIONS **October 2004**

TABLE OF CONTENTS

Page

List of Annexes
List of Abbreviations
Executive Summary
Basic Project Data

1 INTRODUCTION 1

2 PROJECT OBJECTIVES AND FORMULATION 1
2.1 Project Objectives 1
2.2 Project Formulation 2
2.3 Preparation, Appraisal, Negotiation and Approval 3
2.4 Project Description 3

3 PROJECT EXECUTION 4
3.1 Effectiveness and Start-up 4
3.2 Modifications 5
3.3 Reporting 5
3.4 Implementation Schedule 6
3.5 Procurement 6
3.6 Financial Sources and Disbursement 7

4 PROJECT PERFORMANCE AND RESULTS 8
4.1 Operating Results 8
4.2 Management and Institutional Performance 10
4.3 Fulfilment of conditions and covenants 12
4.4 Financial and Economic Performance 12

5 SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACT 14
5.1 Socio-economic impact 14
5.2 Environmental impact 16

6 PROJECT SUSTAINABILITY 16

7 PERFORMANCE OF THE BANK AND THE BORROWER 17

7.1 Performance of the Bank 17
7.2 Performance of the Borrower 17

8 OVERALL PERFORMANCE AND RATING 17

9 CONCLUSIONS, LESSONS LEARNED AND RECOMMENDATIONS 18
9.1 Conclusions 18
9.2 Lessons Learnt 18
9.3 Recommendations 19

LIST OF TABLES

1	Implementation Schedule: Appraisal versus Actual	6
2	Summary of items in Project Procurement List	7
3	Project Financing	7
4	ADF Project Costs by Component in UA million	8

LIST OF ANNEXES

1	Project location map
2A	Per hectare enterprise budget for irrigated paddy rice
2B	Calculation of Farm gate import parity prices for paddy rice
2C	Project Completion Re-estimation of FIRR
2D	Project Completion Re-estimation of ERR
2E	Summary Estimates of Income & Expenditure for other sub components
2F	Financial Performance Ratios of Cooperatives
3	Implementation Performance
4	Bank Performance
5	Project outcome ratings
6	Recommendations and Follow-up Matrix
7	Summary of project achievements
8	Sources of Information

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LIST OF ACRONYMS

ADB	African Development Bank
ADF	African Development Fund
ADF	African Development Foundation (USA: NGO)
ASDS	Agricultural Sector Development Strategy
COASCO	Cooperate Audit Supervision Corporation (Autonomous audit organization in Tanzania)
CRDB	Cooperative Rural Development Bank
DAIPESA	Development Alternatives Inc. for Private Enterprise Support Activities (USAID Funded NGO)
FAO	Food and Agricultural Organization of the United Nations
FIRR	Financial Internal Rate of Return
FOB	Free On Board
GDP	Gross Domestic Product
GOT	Government of Tanzania
IERR	Internal Economic Rate of Return
M&E	Monitoring and Evaluation
MAMCOS	Madibira Agricultural and Marketing Cooperative Society
M-SACCOS	Madibira Savings and Credit Cooperative Society
MSADP	Madibira Smallholder Agricultural Development Project
NAFCO	National Agriculture and Food Corporation
PCR	Project Completion Report
PIMU	Project Implementation and Management Unit
PRSP	Poverty Reduction Strategy Paper
QPR	Quarterly Progress Report
SACCO	Savings and Credit Cooperative Societies
UA	Unit of Account

EXECUTIVE SUMMARY

1. Project sector goal and objectives: The sector goal of the project was to support the Government of Tanzania efforts to increase GDP growth and poverty reduction through enhanced rice productivity by smallholder farmers on 3,000 ha of irrigable land that would contribute to import substitution. The direct objectives were to: (i) increase household incomes, (ii) improve access to health services and (iii) increase school enrolment. The components include establishment of irrigation and drainage infrastructure on 3,000 ha, provision of scheme infrastructure and services, development of agricultural activities, environment and project management. The main activities were the construction of irrigation structures, roads, and farm buildings. Others include installation of rice mill, provision of farm equipment and vehicles, boreholes for supply of clean drinking water, construction of health clinic, establishment of farmers' cooperative society and micro-credit facility.

2. Implementation: The project was appraised in March 1993 and the loan was approved on 3 September 1993. While the loan agreement was signed on 24 November 1993, disbursement did not become effective until 18 months later (31 July 1995) due mainly to the difficulty in recruiting the Technical Assistant and other key project staff. Due to the delay in starting the project, and inherent heavy civil works of irrigation projects, the original five-year project was extended to nine years, running from November 1993 to December 2002. Nevertheless, the delay did not result in project cost-overrun.

3. Physical Achievements: Despite the delay in project take-off, the overall performance of the project is satisfactory. The project made significant positive development changes inthe project area in relation to provision of : (i) 3,000 ha irrigable land to 3,000 stallholder farmers, (ii) potable water to about 20,000 people, (iii) credit facilities**, (**iv) health facilities, (v) establishment of demand driven farmers' cooperative society, and (v) capacity building of the beneficiaries.

Achievements by components are estimated at 97% for irrigation and drainage infrastructure, 98% infrastructure and services, 90% development of agricultural activities, 70% environment and 99% project management. The overall performance of the project is attributable to the extension of the project life from 5 to 9 years, continuous Government support of project activities, frequent Bank supervision missions and the high quality of the civil works contractor.

4. Impact on Development: The project's direct development benefits include: (i) regular cash flow from sales of rice, (ii) access to credit for farm inputs and other income-generating activities, (iii) Access to safe drinking water that contributed to increased productivity of the beneficiaries. (iv) Since 2001, the project injects between Tsh 1-2 billion (approximately 1.2 million 2004 U$D) each year into the local economy through sale of rice and provision of employment opportunities for more than 6,000 seasonal workers, including 40% women,and (v) Rehabilitation of 112 kilometres of feeder and access roads has enhanced marketing activities and general mobility.

5 Loan Utilization and Counterpart Funding: The total loan disbursement as of the date of loan closure (31st December 2002) was UA 21.55 million, representing 98.32% of the total loan approved (UA 21.92 million). Government of Tanzania has been advised to request the cancellation of the undisbursed loan balance of UA 0.37.

6 Counterpart Funding: Out of the estimated Government contribution of UA 2.46 million, the Government released UA 2.56 million amounting to counterpart contribution rate of 104.06%. When compared with final loan utilisation (98.32%), counterpart funding can be said to be satisfactory.

7. Sustainability and viability. The project has introduced significant institutional reforms and accomplished satisfactory levels of community involvement and ownership of the activities. However, as the scheme is a run-of-river type of irrigation, without a water reservoir facility, water shortage is a major threat to the sustainability of project activities. Provision of water harvesting structures would help to address this problem. Furthermore, the continuation of development of investment gains would depend on the strength of scheme management for provision of timely resolution of technical needs and social challenges emanating from the beneficiary community institutions and continued active interactions with various Government institutions at both local and central levels.

8. Conclusion and recommendation: The Madibira Agricultural Development Project is rated satisfactory. Targets set at appraisal were met and in some cases exceeded. The active participation of the beneficiaries from the beginning of project implementation and the success of the project demonstrate that rural communities can be empowered and used to trigger their own development when provided with basic infrastructure. The project should use the established farmers' institutions and existing government structure as key sustainability factors for consolidating investment gains. The economic and financial performance of the project is positive and justifies the investments on the project. Project replication is recommended due to the success of the project, and in particular the high level of enthusiasm of project participants and beneficiaries to continue and build on the success of the project.

8.1 The major lessons learned include: (i) Active involvement of target communities in project implementation and responsibility sharing contribute towards effective poverty reduction and empowerment of vulnerable community groups. (ii) Investment in stream-fed irrigation schemes that does not include water harvesting seriously jeopardize prospects of sustainability and investment gains. (iii) Community labour contribution to irrigation construction activities should not include construction of tertiary canals as it is difficult to attain the required compaction levels by farmers due to lack of essential compaction tools/ equipment and technical know-how. Farmers' works could be limited to excavation of drains, which are not involving compaction activities.

BASIC PROJECT DATA

1	Country	Tanzania
2	Project Title	Madibira Smallholder Agricultural Development Project
3	Loan Number	2100150000993 (F/TAN/AGR-DEV/93/92)
4	Borrower	The Government of the United Republic of Tanzania
5	Guarantor	The Government of the United Republic of Tanzania
6	Beneficiary	Ministry of Agriculture and Food Security
7	Executing Agency	Ministry of Agriculture and Food Security

A. LOAN

	ITEM	**APPRAISAL ESTIMATE**	**ACTUAL**
	Amount in (UA)	21.92	21.57
1	Interest Rate (Service Charge)	0.75% per annum	
2	Repayment Period	40 years	
3	Grace Period	10 years	
4	Loan Negotiating Date	Not available	
5	Loan Approval Date	August 1993	03/09/93
6	Loan Signature Date	October 93	24/11/1993
7	Date of Entry into Force	December 1993	18/05/1995
8	Date of First Disbursement	Not indicated	31/07/95
9	Deadline of Last Disbursement	December 1998	31/12/ 2002
10	1 UA exchange rate to Tshs.	440.883	1625.32

B. PROJECT DATA

1. Project Cost and Financing	---------- In UA million ----------							
	Appraisal Estimate				**Actual Cost**			
	F.E.	L.C.	Total	%	F.E.	L.C.	Total	%
ADF	19.31	2.61	21.92	89.91	14.77	6.78	21.55	88.97
GOU	-	2.46	2.46	10.09	-	2.56	2.56	11.03
Total	19.31	5.07	24.38	100	14.77	9.34	24.11	100

2.	Date of First Disbursement **31/07/1995**
3.	Initial Deadline of Last Disbursement 31/12/1998
4.	Actual Date of Last Disbursement 31/12/2002

C. PERFORMANCE INDICATORS

1.	Cost under-run	UA 0.27 million	
2.	Time overruns: Slippage on effectiveness Slippage of completion Date Slippage of last disbursement No. of extensions of last disbursement	 18 months 4 years 4 years 2	
3.	Project Implementation status	Completed	
4.	Institutional Performance	Satisfactory	
5	Contract Performance	Satisfactory	
6	Consultant Performance	Satisfactory	
7		**Appraisal**	**PCR**
	EIRR	**12.44%**	**18%**
	FIRR	**9.37%**	**13%**

D. BANK MISSIONS

MISSION TYPE	DATE	Composition	Person days
Identification	1976	Not available	-
Preparation	Nov-Dec 992	Not available	-
Appraisal	March 1993	Agri. Economist/Agronomist/ Environmentalist/Gender Specialist/ Irrigation Engineer/ Financial Analyst	90
Launching	Not available	-	-
Supervision	January 1995	Agri. Economist/Agronomist/ Environmentalist/ Irrigation Engineer	21
Follow-up	Feb 1996	Agric Economist	4
Supervision	Feb 1997	Irrigation Engineer/Agronomist	22
Supervision	Oct 98	Agronomist/Agri. Economist Irrigation Engineer/ Environmentalist/ Financial Analyst	88
Supervision	Feb-Mar 99	Agronomist/Agri. Economist Irrigation Engineer/Environmentalist	48
Supervision	April 2000	Agronomist/ Environmentalist	28
Supervision	Nov 2000	Agronomist/ Irrigation Engineer Agri. Economist	36
Follow-up	Aug 2001	Agronomist	7
Supervision	May 2001	Agronomist/Irrigation Engineer Agri. Economist	45
Monitoring (OPEV)	Jan 2002	Economist	2
Supervision	Feb 2002	Agronomist/ Agri. Economist	24
Supervision	Dec 2002	Agronomist	14
PCR	June 2004	Agronomist/Agri.Economist-Credit Expert	28

E. YEARLY DISBURSEMENT BY ADF

Year	Appraisal Estimate		Actual (PCR)	
	Amount UA mil.	(%)	Amount UA mil.	(%)
1993				
1994	1.30			
1995	7.65		0.54	
1996	7.20		1.51	
1997	3.04		6.53	
1998	2.73		8.59	
1999			2.26	
2000			0.99	
2001			0.74	
2002			0.39	
Total	21.92	100	21.55	98.32
Undisbursed balance			0.37	1.68

F: CONTRACTORS, SUPPLIERS AND CONSULTANTS

Name	Task/Activity	Date Contract Signed	Date Contract completed	Amount
CMC Land Rover Ltd	Supply 3 motor vehicles	6 Oct. 95	21 Nov 95	STG 55,125
Diamond Motors ltd	Supply 3 motor vehicles	6 Nov 95	31 Jan 96	STG 5,656,271
MES International Ltd	Supply survey equipment	27 June 96	11 July 96	STG 40,833.40
InfoTech Computers Ltd	Supply Office Equipment	4 June 96	4 July 96	US$ 63,251.3
F.H. Schule Muhlenbau GmbH	Supply and install Rice Milling Facility	7 May 97	30 Sept. 98	DEM 1,327,401
GODES Ltd	Construct Project Infrastructure and provide services	3 Dec 96	5 Dec 97	Tshs 1.1 billion
International Motor Ltd	Supply one motor vehicle	7 Aug 96	9 Sept 96	Tshs 1.2 million
Murray and Roberts/Noremco	Construct Main civil works	21 Mar 97	19 Aug 99	Tshs 13.29 billion
Jos Hansen & Soehne Aussen handelsges mbH	Supply farm and construction equipment	23 Dec 97	15 Nov 98	US$ 982,280
Sumitomo Corporation	Supply Transport equipment	5 Jan 98	20 Dec 98	JPY 24,692,000
UNDP/Inter Agency Procurement Services	Supply one motor vehicle	23 Oct 01	30 June 02	JPY 2,722,947
UNDP/Inter Agency Procurement Services	Supply one tractor	23 Oct 01	30 June 02	Euro 48,908

Southern Link Ltd	Re-grade and level land	15 Nov 2001	30 Dec 01	Tshs 146,250,000
Sir William Halcrow and Partners Ltd. In Association with TANConsult Ltd.	Design and Supervise civil works	12 May 95	August 2000	GBP 1,378,957.83
Danagro Advisers A/S Grans Koven	Technical Assistance	28 Aug 95	Dec 2000	DKK 9,728,310

MADIBIRA SMALLHOLDER AGRICULTURAL DEVELOPMENT –LOGICAL FRAMEWORK MATRIX

Narrative summary	**Verifiable indicators**	**Means of verification**	**Assumptions**
Sector Goal	**Appraisal**		
Contribute to GDP growth and poverty alleviation	% increase in GDP Increase in household income Improved access to health services	Reports	Reform programme is on track Stable weather Mafinga-Madibira-Rujewa road improved on time
Project objectives			
1. Enhance the productive capacity of smallholders in the production of Rice and Beans	Increase in production of Rice in tones as follows: 1996 1998 2000 Rice3500 13500 15000	Yields records from PIMU reports	Farmers willingness to adopt new technologies Rural micro finance available
2. Improved living standards	Net income per smallholder would increase from Tshs. 250,000 to 493,000	Yields records from PIMU reports	Market availability at competitive price Ground water availability
3. Sustainable management of environment and wildlife	Conserve and reforest 500 ha; Improvement in potable domestic water	Project quarterly reports	NEMC and PIMU will monitor the environment
Outputs			
i) Irrigation and Drainage Infrastructure Development Component: 1.Develop 3,000 rice irrigated ha farm by 1998 2. Provide access and track roads	**Appraisal** **Actual** 1. 3,000 ha developed by 1998 450 ha developed by 1998 2. 80 km access and 60 track roads provided 80 km access and 60 track roads provided	Quarterly and annual reports Government PCR	Competent contractor is recruited for civil works

Narrative summary	Verifiable indicators	Means of verification	Assumptions
ii) Infrastructure and services component: 1. Build 13 staff houses, 1 clinic, 1 environmental laboratory, and rehabilitation of existing building 2. Provision of clean drinking water	**Appraisal** / **Actual** 1. 13 staff houses, 1 clinic and 1 laboratory built; rehabilitation work undertaken — 1. All accomplished as planned 2. One borehole per each of the 5 project villages provided — 2. 17 boreholes supplied	Quarterly and annual reports Government PCR	Supply of drugs available for the clinic and willingness of community to pay for services
iii) Agricultural Development component: 1. Establish a cooperative society 2. Install a mill 3. Establish a research and demonstration farm 4. Provision of credit facilities	1. Madibira Agric. Marketing Coop. Established by1997. — 1. Established as planned 2. Install 1 mill with a capacity of 4 tonnes output per hour — 2. Mill with capacity 3.5/hour installed 3. Establish 50 ha research farm — 3. Farm established as planned 4. Establish a revolving fund — 4. Micro-finance (SACCOS) established	Quarterly progress reports Government PCR	Willingness of farmers to form a cooperative society and Government to provide necessary support
iv) **Environnemental component:** 1. Construct environmental monitoring lab. and wildlife protection	1. Build two roomed environmental laboratory, and construct of buffer zone fence — 1. One two rooms lab. Built; buffer zone fence build by wild life Department	Quarterly progress reports	Supply of chemicals available for environmental laboratory
v) Project management : 1. Procure international and local technical assistance teams 2. Procure vehicles, farm machinery and office equipment	1. Procure 164 man-months TA plus 42 support staff — 1. Procurement 150 international TA and 183 man-months national undertaken 2. Undertake procurement of vehicles, farm machinery and office equipment — 2. Procurement undertaken as planned	Quarterly progress reports and Government PCR	

Narrative summary	Verifiable indicators		Means of verification	Assumptions
Activities	UA million			
	Appraisal allocations	**Actual**	Project List of Goods and Services, Quarterly progress reports and Government PCR	
Irrigation & drainage	12.18	13.44		
Agriculture Development	4.02	2.14		
Infrastructure	2.33	1.37		
Environment	0.27	0.01		
Project Management	3.13	4.96		
Total	21.92	21.55		

1 . INTRODUCTION

1.1 The United Republic of Tanzania is located on the south-eastern coast of Africa and comprises the mainland and two islands (Zanzibar and Pemba). Its total area is about 945 090 km^2 with a cultivable area of about 40 million hectares, or 42% of the total land area. The actual cultivated area is about 6.3 million hectares, which is 7% of the total area and 16% of the cultivable area. Since the mid-1990s, Tanzania has made substantial progress in macroeconomic stabilisation and structural reforms of the economy. At the beginning of the reform process, economic growth was slow to pick up, but over the last five years it has averaged more than 5%. The positive development continued into 2002 when real GDP grew by 6.2%. This growth was mainly attributed to the contribution of the agriculture sector (47.5%).

1.2 The country has vast fresh water resources with an annual exploitable volume estimated at 110 billion cubic meters, out of which, 75% comprises surface water. The potential for irrigation development is estimated to be 828 000 hectares or 2% of the cultivable area. The main crops in large-scale irrigation projects are rice and sugar cane, with the latter occupying about 10,000 ha of the irrigated area. In small-scale projects, most of the irrigated area is occupied by rice and horticultural crops.

1.3 Despite the huge potential of land and water resources, Tanzania is frequently faced with food insecurity due to limited irrigation facilities and under-developed water harvesting technologies. Desirous of improving smallholder agriculture productivity and rural household incomes, the Government of Tanzania embarked on an economic reconstruction programme since 1986 with emphasis on the improvement of services to the agricultural sector. It is within this framework and the Government ‘s commitment to rural poverty reduction that the Bank agreed to support the Madibira Smallholder Agricultural Development project along the lines of a detailed engineering study conducted in 1985 and the preparation report of 1992.

1.4 On 31st December 2002, there were 19 agricultural operations undertaken by the Bank in the country, out of a total of 81 operations amounting to UA 132.88 million of cumulative Bank commitment in Tanzania. The Bank Group’s assistance to the sector has been in support of food security, mainly in the areas of irrigation development, livestock production, sugar factory development, agricultural research and extension, and in the recent past, wildlife conservation and agricultural marketing.

1.5 This project completion report presents a summary of the performance of the Madibira smallholder Agricultural Development Project. It reflects the findings of a Bank PCR mission that visited Tanzania from 01-14 June 2004. It also draws on information from a variety of secondary data sources, including the Borrower’s PCR; Appraisal Report, Audit Reports, project files, stakeholders meetings, Irrigation Master Plan and GOT’s Main Report on the Agriculture Strategy Development Paper 2002 *(*see Annex 7).

2 PROJECT OBJECTIVES AND FORMULATION

2.1 Project Objectives

The sector goal as defined in the Appraisal Report is to contribute to GDP growth and poverty reduction in the project area, which would be achieved through, (i) increased household income, (ii) increased access to health services, and (iii) increased school enrolment. This objective is still relevant to the current GOT strategy of using agricultural development as leverage for economic and social development for the rural areas where more than 80% of the population derive their livelihood from agricultural activities. It also fits aptly with the Bank’s

Vision of Poverty reduction in Regional Member Countries. In order to accomplish the above objective, the following activities were planned and undertaken:

(i) Develop irrigation and drainage infrastructure covering 3,000 ha;
(ii) Develop irrigated rice and bean production covering 3,000 ha.
(iii) Provide and upgrade the necessary physical infrastructure;
(iv) Provide transport, farm machinery and office equipment and furniture;
(v) Provide management and technical assistance teams for the implementation of the project;
(vi) Establish the Madibira Agricultural and Marketing Cooperative (MAMCOS);
(vii) Provide micro-finance services to farmers through M-SACCOS for procurement of farm inputs; and
(viii) Install a rice milling plant to add value and enhance marketing.

2.2 Formulation

2.2.1 The project site, which lies within the Usangu Plains in Mbeya region, was first identified by the FAO in the 1960s during the Rufiji Basin Study. In 1976, the Bank, in conjunction with FAO, mounted an identification mission specifically to the Madibira Area. The mission's conclusion was positive about the potential for large-scale production of rice under irrigation in the Madibira area. Subsequently, a consulting firm was requested to carry out a detailed feasibility study and produced a "Detailed Engineering Report of Kapunga/Madibira Projects." The Kapunga/Madibira Project was found to be both economically and financially attractive but with the huge investment cost, it was phased-out into two projects, Kapunga and Madibira. The first phase, involving the Kapunga project, was funded by the Bank from 23 Dec 1987 to 31st December 1994 and was successfully completed but not sustainable. The major reasons for the lack of sustainability include (i) Non-involvement of communities in project formulation and implementation (ii) use of highly sophisticated equipment that was far beyond the ability of farmers to use and lack of ownership of plots by farmers who were only hired as labourers. The second phase is the Madibira Smallholder Agricultural Development Project (MSADP), which is the subject of this report.

2.2.2 With respect to the MSADP, a detailed 1985 engineering study recommended a project providing irrigation works and infrastructure for 3,180 hectares including 1,550 hectares for smallholders and 1,630 as a National Agricultural and Food Corporation (NAFCO) mechanised farm. Also included in the project were the dam at Lugoda, the Maluma Falls hydroelectric station and upgrading of the roads to Madibira and Rujewa. The cost of the proposed project was found to be very high and therefore had to be scaled down. Consequently, the dam and hydroelectric station were dropped. A weir on a small river was substituted and a run-of-river-type irrigation was adopted. The upgrading of the Madibira - Rujewa road connection was also deleted and the responsibility taken over by the Government. The area for development was also reduced to 3,000 ha with smallholders occupying 2,000 ha and NAFCO the remaining 1,000 ha.

2.2.3 With the advent of the Economic Reform Programme in 1986, the Government introduced major policy reforms in the agriculture sector as part of the Economic Recovery Programme. These policies included increased producer prices in real terms and the re-establishment of co-operatives to handle agricultural marketing and input distribution activities. It also became obligatory for the GOT to divorce itself from any direct production activities. Thus NAFCO, a Government organisation, was removed from the plans and the project became a smallholder project on 3,000 ha land with each farmer to be allocated a one-hectare individually–owned plot. It is in this context that the project was conceived.

2.3 Preparation, Appraisal, Negotiations and Approval

2.3.1 Encouraged by the positive response from both multilateral and bilateral donors to support agricultural reforms, the GOT requested the Bank for financial support of the Madibira project in 1992. The project was prepared in 1992 and appraised in March 1993. The loan was approved on 03 September 1993, signed on 24 November 1993 and became effective on 08 May 1995.

2.3.2 Although Project design was based on good diagnosis of critical issues of increasing agricultural productivity in rural areas as a means for reducing poverty in Tanzania, the decision to drop the dam as explained in paragraph 2.2.2 above has resulted in shortage of irrigation water that is threatening the sustainability of investment gains. It may have been better to construct a smaller dam that is more environmentally friendly and easier to be managed by farmers as water reservoir for supplemental irrigation instead of completely removing the dam in the plan. The other weakness in design relates to the requirement that the GOT pays 20% of the civil works' contract. Delayed payments by the Government to the contractor induced payment of interest as a penalty for the late payment. The government should have taken charge of operation costs that were paid from the loan. Notwithstanding these weaknesses, the project concept was and still is, fully consistent with current national development policies of Tanzania.

2.4 Project Description

2.4.1 In order to achieve the objectives stated under item 2.1 above, the project delivered outputs against five broad components, (i) Irrigation and drainage infrastructure; (ii) Agricultural development; (iii) Infrastructure and services; (iv) Environment and (v) Project management as summarised below.

i) Irrigation and Drainage Infrastructure Development:

2.4.2 The project was to establish 3,000 ha of physical irrigation infrastructure that would consist of: a flood protection dyke with total length of 20 km; a rockfilled diversion weir and a controlled intake structure; a primary canal with a discharge carrying capacity of approximately 12 m3/sec and total length of about 5.5km; five secondary canals with a total length of about 20km; four drainage canals totaling approximately 37 km in length; land leveling of about 3,000 ha by the smallholder farmers; tertiary canals; 80 km of access and 60 km of track roads.

ii) Infrastructure and Services

2.4.3 Under this component, the project was to provide infrastructural facilities and services in addition to the rehabilitation of the building that existed before the project. These facilities and services included the following:

- Buildings: 13 houses (1 guest/rest house, 4 grade A houses for top management staff and 8 semi-detached houses for middle level staff), a dispensary building with two four-bed admission ward rooms, a laboratory for monitoring environmental activities, rehabilitation of equipment shelter, workshop, a store room and an office building.
- Water Supply: the project was to provide 5 boreholes, one in each of the 5 project villages as a source of potable water. Separate water supply was to be provided to the project buildings and staff houses.

iii) Agricultural development

2.4.4 Under this component the project would establish the following activities:

- Production: double cropping of rice and beans on 3,000 ha; variety testing and diffusion of improved technologies to the community and provision of power tillers and threshing machines.
- Cooperative and Credit facilities to smallholder farmers: The project would provide credit facilities as a revolving fund for farmers for procurement of farm inputs and services to enable timely operation of farm activities, in addition. a cooperative society was to be established.
- Milling Plant: The project would also provide a milling plant with a capacity of processing 4 mt of rice per hour. The milling plant with a capacity of processing 3.5 mt per hour has been installed.

iv) Environment

2.4.5 Under this component, the project was to construct one health clinic and a laboratory for monitoring environmental activities; reafforestate 500 ha; distribute 450 wood-energy saving stoves and provide seedlings to the participating farmers. The laboratory would be well equipped and necessary chemicals provided for testing soil nutrients, monitoring of irrigation water quality and agro-chemical residues in drainage water. These activities were aimed at mitigating environmental degradation in the project area and creating awareness to the communities on the need to conserve the environment.

v) Project management

2.4.6 The project was to supply management expertise for carrying out:

- (i) necessary construction works; (ii) managing production activities by assisting farmers and cooperative society
- A technical assistance (TA) team and the consulting engineering firm would provide services estimated at 164 man-months and 183 man-months, respectively. The TA team would comprise an Agricultural Economist, Irrigation Engineer, Agronomist, Rural Sociologist, and Financial Expert. Local counterpart staff comprising Project Manager, Internal Auditor, Accountant /Administrative Officer, Marketing Officer, Irrigation Engineer, Agronomist, Agricultural Economist, Cooperative Officer, 2 Surveyors, Sociologist, Agriculture Engineer, and Environmentalist. The project was also to hire 42 support staff belonging to various categories. All staff were paid from the loan resources.

3 PROJECT EXECUTION

3.1 Effectiveness and Start-up

The loan was approved in September 1993 and signed in November 1993. First disbursement was projected for May 1994, but became effective on 31 July 1995, due to delays in fulfilling loan conditions by the borrower. The loan conditions are presented in section 4.4.1 of this report. Thus the project start-up was delayed for 18 months.

3.2 Modifications

The following five modifications were made:

(i) Due to a shortage of irrigation water, it was impossible to double crop rice and beans as envisaged at appraisal, thus only one crop of rice is being cultivated in the scheme. This modification though beyond the control of the project, has negative effects on issues regarding profit maximization and sustainability of the cropping enterprises.

(ii) The revolving fund was to be managed by the Project Implementation Management Unit (PIMU) for the first two years, and thereafter, passed to the cooperative society. With the advent of liberalised markets, it was decided to establish a proper micro finance institution, the Madibira Savings and Credit Cooperative Society (M-SACCOS). The performance of M-SACCOS has been impressive as described in section 4.2.4 of this report.

(iii) The project was to provide 5 boreholes, one in each of the five project villages. Instead, the project provided additional 17 shallow wells (with depths ranging from 10m up to 30m) for supply of domestic water to the beneficiary villages at a distribution of 3 in Ikoga, 2 in Mapogoro, 7 in Mahango and 5 in Mkunywa. This decision was made due to the prevalence and recurrence of diarrhoea in the project villages and the fact that the difference in cost was not much. The supply of water has provided access to portable water to almost all the inhabitants of the beneficiary villages with a reduction in time used for fetching water from an average of 1.5 hours to 30 minutes.

(iv) The decision to supply the environmental laboratory with equipment and chemicals for testing soil nutrients, monitoring irrigation water quality and agro-chemical residues in drainage water was reversed during the course of implementation because it was not found to be sustainable. Instead, the soil and water samples were sent to the regional environmental laboratory in Mbeya, about two hundred kilometres from the project site. This decision was found to be cost effective and sustainable as the samples are only tested once a year.

(v) The management of the Madibira scheme was to be handed over to its cooperative society, the Madibira Smallholder Agricultural Marketing Cooperative (MAMCOS). This is in line with the Agriculture and Livestock Policy of 1997 that the Government should not be involved in direct processes of production, but rather in the creation of an enabling environment for production activities being undertaken by the private sector. However, the integration of sophisticated heavy farm machinery with smallholder production compels the scheme activities to be operated through application of entrepreneurship principles under a commercial business setting. This situation has made the Government to continue providing capacity building to MAMCOS, as well as to M-SACCOS and to offer the use of heavy farm machinery on hire basis to farmers.

3.3 Reporting

In accordance with the provision of the General Conditions of the loan agreement on submission of reports, the Executing Agency submitted 29 Quarterly Progress Reports and 8 Audit Reports from 1995 to 2002. The reports were comprehensive in terms of information on project activities and areas that needed improvement. They were found satisfactory as they facilitated the Bank and Government to take timely corrective measures. The audit reports had no major queries from the Bank.

3.4 Implementation Schedule

The project was to be implemented within a period of 5 years (December 1993– December 1998). Taking into account the effective disbursement date of 31 July 1995, project implementation covered a period of 6 years and 5 months (July 1995 – December 2002). This was due to delays in fulfilling some of the loan conditions that were considered vital for the smooth implementation of the project, such as, hiring of the project manager, TA and mobilisation of project implementation management staff that was one of the loan conditions to be fulfilled prior to the first disbursement of the loan. The project Implementation Management Unit (PIMU) was constituted in June 1995. Table one below summarizes planned versus actual implementation of activities.

Table 1. Implementation schedule, appraisal dates versus actual dates

	Activity	**Planned Commencement dates at appraisal**	**Actual Implementation dates**
1	Board Approval	Aug 1993	September 1993
2	Loan Signature	Oct. 1993	Nov 24 1993
3	Recruitment of Project Manager	Dec 1993	Sept 1994
4	Loan Effectiveness	Dec 1993	May 18 1995
5	Appointment of consultants	Dec 1993	May 95-Aug 98
6	Revision of engineering Designs and Tender Documents	Jan 1994	May 95
7	Tender & award of contracts for civil works	March-Sept 1994	Sept 95-May 97
8	Mobilization of Contractor	Nov 94 - Feb 95	Nov 94-Nov 01
9	Construction of civil works	Feb 95 – Aug 97	Aug 95-Apr 99
10	Purchase of machinery and equipment	1994/1997	June 95-Oct 01
11	Registration/allocation of farmers' land	Commencing Jan 94	June 97-2001
12	Smallholder on-farm development	June 1995	Sept 1998
13	First Cropping of Rice	Jan 1996	1998/99 season
14	Technical Assistance	Jan 94- Dec 1998	July 95- Dec 02
15	Project Completion	Dec 1998	31 Dec 2002

3.5 Procurement

3.5.1 The technical assistance, contractors, farm machinery, milling plant, vehicles, and heavy equipment required to facilitate project implementation were satisfactorily procured. However, because the bulk of vehicles and farm equipment were procured in 1996, most of the farm machinery currently needs repair and vehicles need replacement. Presently, the scheme management has no reliable means of transportation for undertaking project/scheme activities and there are no funds to repair the existing equipment and machinery since the Mbarali District is one of the new districts in Tanzania, and during the phasing period, can only first afford the provision of three extension staff for technical backstopping. A summary of the procurement undertaken is presented in table 2 below:

Table 2. Summary of items in Project Procurement List

	Item Description	**Mode of Procurement**
1	Motor Vehicles	International shopping
2	Survey Equipment	National Competitive Bidding
3	Office Equipment	National Shopping
4	Rice Milling Facility	International Competitive Bidding
5	Construction of project Infrastructure and provision of services	International Competitive Bidding
6	Construction of Main civil works	International Competitive Bidding
7	Farm and construction equipment	International Competitive Bidding
8	Re-grade and level land	National Competitive Bidding

3.5.2 ADF funds were used to finance all procurement. All the items have been successfully procured by the project and there have been no cases of litigation or dispute in relation to this activity.

3.6 Financial Sources and Disbursement

3.6.1 Sources of Finance: The total project cost was estimated at UA 24.38 million, as shown in Table 3. The ADF financed 100% of the foreign exchange costs associated with each of the Project's investment components. It also provided funds for covering 31.5 percent of the local costs. The GOT's contribution was for financing 20% of the irrigation development civil works in local currency. This arrangement caused financial difficulties on the Government budget for counterpart funds for agricultural donor funded projects as most of the funds had to be used for paying the civil works contractor for the subject project. Furthermore the Government paid about UA 0.10 million interest as penalty for late payment to the civil works contractor.

Table 3. Project Financing

1. Project Cost and Financing	---------- In UA million ----------							
	Appraisal Estimate				**PCR Cost**			
	F.E.	L.C.	Total	%	F.E.	L.C.	Total	%
ADF	19.31	2.61	21.92	89.91	14.77	6.78	21.55	88.97
GOU	-	2.46	2.46	10.09	-	2.56	2.56	11.03
Total	19.31	5.07	24.38	100	14.77	9.34	24.11	100

3.6.2 Table 4 below shows ADF budgetary allocations under various categories of expenditure. While irrigation development and project management were upwardly revised, the budget for environment activities was lowered by a substantial amount due to changes of plans not to buy laboratory equipment and chemicals as explained in section 3.2 (iv). Budgetary allocation for irrigation and drainage infrastructure development increased due to price escalation of construction materials. The substantial increase in cost of project management component was due to the fact that consultancy contracts of the TA and the engineering supervising firm were paid from budgetary allocation of project management.

Table 4: ADF Project costs by Component in UA million

Component	Appraisal	Revised	% Variance
Irrigation & drainage Infrastructure Dev.	12.18	13.44	+9%
Agriculture Development	4.02	2.14	-53%
Infrastructure	2.33	1.37	-43%
Environment	0.27	0.01	-96%
Project Management	3.13	4.96	+58%
Total Costs	21.92	21.92	

3.6.3 **Disbursement:** The first disbursement of the loan proceeds was on 31 July 1995. The last disbursement deadline was on 31 December 2002. The loan funds were disbursed by direct method to the contractors, suppliers and consultants, while funds for operations were disbursed to the project account. At the end of the disbursement deadline, total amount disbursed was UA 21.55 million, as indicated in Table 3 above. Thus, the total disbursement rate of the loan stood at 98.32%, leaving a balance of UA 0.37 million. The Government has been advised to request cancellation of the undisbursed balance. Out of the estimated Government contribution of UA 2.46 million, the Government released UA 2.56 million in cash, resulting in a counterpart contribution rate of 106 %.

4 PROJECT PERFORMANCE AND RESULTS

4.1 Operating Results

4.1.1 **Overall Assessment:** The sector goal of the project was to contribute to GDP growth and poverty reduction. The specific objectives were to (i) increase household income, (ii) increase access to health services, and (iii) increase school enrolment. Achievements by components are estimated at 97% for irrigation and drainage infrastructure, 98% infrastructure and services, 90% development of agricultural activities, 70% environment and 99% project management. Out of a 4 point score, the project is rated 2.5 (Annex 5), as it has accomplished the objectives as demonstrated below under each of the activities that were used as strategies for achieving the objectives.

4.1.2 **Irrigation and Drainage Infrastructure Development:** All the physical targets set at appraisal under this component that include construction of flood protection dyke with total length of 20 km; a rockfilled diversion weir and a controlled intake structure; a primary canal with a discharge carrying capacity of approximately 12 m3/sec and total length of about 5.5km; five secondary canals with total length of about 20km; four drainage canals totalling approximately 37 km in length; land levelling of about 3,000 ha by the smallholder farmers; tertiary canals and 80 km of access and 60 km of tracks roads, have been accomplished.

4.1.2.1 Targets for the construction of primary secondary and tertiary canals, drains, settling basins, rock filled weirs and flood protection bunds, were exceeded by 40%, compared to design-targets at appraisal as detailed in Annex 8, without affecting the contract price. The quality of the irrigation and drainage infrastructure erected by the contractors is of exceedingly high quality. However, the tertiary and field canals constructed by farmers are likely to experience high maintenance cost due to poor compaction, resulting from none use of proper equipment/tools for compaction.

4.1.3 **Infrastructure and Services:** Under this component, the project was to provide buildings, potable clean water for drinking to the beneficiary villages, rehabilitation/construction of access roads and tracks. All the planned physical outputs were accomplished. These include construction of 13 houses; a health dispensary building with two four-bed admission ward rooms, a laboratory for monitoring environmental activities, rehabilitation of equipment shelter, workshop, a store room and an office building. All planned construction works were undertaken. The buildings are of acceptable standard.

4.1.3.1 Water supply: The project sunk five boreholes as planned at appraisal and added 17 more shallow wells with the aim of preventing water borne diseases in the project area as highlighted in section 3.2 of this report. The addition of 17 wells was possible because the funds that were earmarked for the environmental laboratory equipment and chemicals were sufficient to cover the additional cost. The project also provided six water troughs for cattle grazing between Mapogoro and Ikoga villages so as to enable the herdsmen provide drinking water for their cattle. The provision of drinking water for cattle was aimed at preventing the herdsmen from vandalising domestic water pipe lines and opening the irrigation floodgates in order to provide water for their cattle. However, the use of troughs was not found to be practical and sustainable as it can only be effectively used by small herds of cattle since animals cannot queue for services. In this case, where thousands of animals are involved, provision of small ponds may have been more effective.

4.1.3.2 Health Centre: One health clinic was constructed and manned by four medical staff that, on the average, treated 700 cases per month at a subsidised cost. The clinic has since been handed over to the Mbarali district health department that has a budget for health services as a means of sustaining the health services at the scheme.

4.1.4 **Agriculture Development:** The project was to provide technical backstopping to farmers for the production and marketing of rice, establishment of farmers' cooperative societies and credit. The milling plant was also to be installed under this component. The performance of the two cooperative societies is described in section 4.2.

4.1.4.1 Production: Actual production was phased gradually to correspond with the level of irrigable land that was being handed over to farmers for cultivation by the civil works contractor. At the time of PCR, 2,910 hectares (or 97%) were allocated to farmers and being cultivated with rice. The remaining 3% have also been allocated but cannot be used for rice production because of unlevelled high ground and depressions that make it difficult to irrigate uniformly. Consequently they are used for the production of upland crops such as sweet potatoes, beans and maize. According to the government's PCR, an average paddy yield per hectare has increased from 2-2.5tons/ha (without the project) to 5.2/ha in 2001/2002 (with the project). Profitability in terms of net income contributed by paddy has been variable but positive. It has increased from Tshs. 145,000.00 per hectare (without project) to Tshs. 207,000.00 per hectare (with the project) in 2001/2002 season. Profitability could be improved by minimizing the cost of land preparation. For example, heavy harrow and rotavating using tractors cost Tshs. 100,000 per ha. While ploughing, using heavy harrow and rotavating using power tiller cost Tshs 62,000 per ha.

4.1.4.2 Field training in improved crop husbandry practices such as deep ploughing, appropriate seeding techniques, timely planting and integrated pest management strategy was undertaken. The use of light farm machinery for crop husbandry and harvesting, such as power tillers and threshers were also demonstrated to farmers. At the end of loan disbursement, 40 farmers had bought their own power tillers that were also being hired by other farmers for land preparation and transport of farm produce from the farm.

4.1.4.3 Rice Mill Plant: To minimize post-harvest losses and bring added value to the paddy, it was envisaged that the project would install a milling plant. The mill has been installed and is operational. However, with the advent liberalized economy, the Bank advised the GOT to lease or privatize the mill to a private service provider who would become one of the buyers of paddy from MAMCOS members and other rice producers in Mbarali District, as well as generate local employment in 2000. Despite Bank supervision missions repeated reminders to the Government, action has been slow, mainly because the issue needs Parliament authority.

4.1.5: **Environment:** The project was to construct and equip the laboratory for monitoring environmental activities; reafforestate 500 ha of fuel wood, degraded project areas and also for agro-forestry activities; distribute 450 wood-energy saving stoves; and provide seedlings to the participating farmers. The project managed to plant trees in various locations totaling about 20 ha, distributed 250 wood saving stoves and about 100,000 seedlings to communities for tree planting.

4.2 Management and Institutional Performance

4.2.1 Project Management: The Ministry of Agriculture and Food Security (MAFS) is the project implementing agency. A Project Steering Committee (PSC) comprising the MAFS, Ministry of Cooperatives and Marketing (MOC), Ministry of Finance Ministry of Local Government, the National Environmental Management Council (NEMC) and Mabarli District was established to oversee and guide project implementation. This committee met 12 times to discuss and resolve inter-ministerial issues and sustainability of project investment, as well as provide leadership to the project. The Project Implementation and Management Unit (PIMU) comprising a team of 65 local and international staff was hired specifically for the purpose of project implementation and all the staff were paid from the proceeds of the loan. The PIMU management, the Land Allocation and Adjudication Committee (LAAC), and at a later stage, MAMCOS jointly coordinated project activities. The efforts and cooperation of these institutions and stakeholders contributed highly in ensuring implementation success of the project.

4.2.2 Training. As the project was implemented by a team of consultants, the focus on training was on capacity building of the farmers and the private sector in the project area. In all, 306 community members, including 70 female members, participated in various training sessions and study tours organized by the project. The training included various themes such as cooperative management, community mobilisation, simple bookkeeping, water management for irrigation, crop production and marketing. Sixty owners of farm machineries from the project area were also trained in best practices for maintenance of farm equipment with the aim of building the agro-private sector within the local community as a means for strengthening sustainability of project activities. On farm training of Water Users Associations and improved agronomic practices was also periodically undertaken through learning by doing in the field. The field training was conducted by the project field extension staff.

4.2.3 Establishment of Madibira Agricultural and Marketing Cooperative Society (MAMCOS): MAMCOS is the official organization representing all farmers participating in the cultivation of rice on the 3000 hectares of the Madibira scheme. The MAMCOS has been a registered legal entity since May 1997 and owns the scheme. It has 3,091 members with 1,409 additional members on the waiting list. The Cooperative management has fifteen members, three from each village and five of the members are women. It has 5,799 paid up shares worth 28,995,000 Tsh, which is about 9.6% of the authorized share capital of 18,093 shares worth 90,465,000 Tsh. MAMCOS as an institution vested with the responsibility of handling

production and marketing activities of the scheme, still needs more training in cooperative management, community mobilization, simple bookkeeping, skills development in areas such as water management for irrigation, crop production, marketing and post harvest handling and credit management. The Mbarali district officials as well as officials at central Government level are fully aware of this need and have assigned a small group of staff to continue with capacity building activities during the phasing out period. The dual responsibilities of production and marketing for MAMCOS management proved to be a major challenge as the two functions require different skills, and therefore, would need to be handled by different but inter-related institutions. As a result of this complexity MAMCOs management sold rice on credit worth Tshs 81 million in 2002 through credit to unreliable individuals who could not settle their debts.

4.2.4 The Madibira Savings and Credit Cooperative Society (M-SACCOS): The M-SACCOS has been a registered legal entity since 1998 and received a seed capital of Tsh 600 million in 2000, which it has successfully increased into a total working capital of Tshs 715 462 385 by 31st May 2004. The Balance sheet account reveals that total assets increased from Tshs 673.8 million in 2002 to Tshs 719.3 million in May 2004. Total liabilities have been kept at a minimum of Tshs 3 852 467, compared to a performing asset of Tshs 713678016. The gross loan portfolio as at 31st May 2004 was Tshs 263,766,737, but this includes delinquent loans (overdue for more than 400 days) of Tsh 81,977,784 owed by MAMCOS and Tsh 828,598 owed by clients who have either died or left the project area. Total operating income reported for 2003 is Tshs 43,181,097, compared with total expenses of Tshs 20,139,622, yielding a total profit of Tshs 23**,**041**,**475**.** The loan loss reserve provision for 2003 is Tsh 2,200,000. Membership shares amount to Tsh 27,645,000, while clients' savings amount to Tsh 35,244,225. **(**Refer to annex 2F financial ratios).

4.2.4.1 M-SACCOS has a permanent full time staff of 4 members (1 manager, 2 bookkeepers and 1 accountant) and 1 cooperative advisor seconded by the Ministry of Cooperatives and Marketing for capacity building. The society has 1,137 active individual, and 5 institutional members (including 36% female members). M-SACCOS plans to hire 2 loan officers in order to provide proximity business advisory services to members and clients. M-SACCOS also plans to attain subsidy-independent status by 2006, with a clientele base of 2,400 active members. To accomplish this, the institution has formulated a detailed business plan to define their growth and expansion strategies over the period covering July 2004-June 2008.

4.2.5 **Performance of Consultants, Suppliers and Contractors:** The Project engaged the services of Sir William Halcrow & Partners of the United Kingdom who were contracted for the detailed design and supervision of the civil works and building works. The firm also assisted in the whole process of procurement of Rice Mill, equipment and farm machinery. Parallel to this/ Danagro Adviser A/S of Denmark were contracted to provide technical assistance to the PIMU. Danagro were required to field an agricultural economist, irrigation engineer, agronomist, financial specialist, environmentalist and sociologist. According to the project reports, the performance of Sir William Halcrow & Partners of United Kingdom was outstanding and on-job training to counter part staff was well appreciated. On the other hand, Danagro had difficulties in fielding the environmentalist and sociologist. Furthermore, it was noted that the areas of expertise which were most appreciated were financial specialist and the irrigation engineer. The irrigation and access road civil works were undertaken by M/s Murray & Roberts in joint venture with NOREMCO of Norway. According to project reports and work on the ground, M/s Murray & Roberts and NOREMCO were rated as very competent contractors, who exceeded their contractual obligation by 40% at no extra cost to the project. The civil works contractor worked up to mid-night in order to finish their work on time. All the irrigation infrastructure and roads are in good working conditions.

4.3 Fulfilment of Conditions/Covenants

4.3.1 The delayed fulfilment of loan conditions precedent to first disbursement numbers 1, 3 and 4 outlined under section 4.3.2 below, resulted in 18 months slippage in starting project activities. The loan was approved in September 1993 and signed in November 1993.

4.3.2 Conditions precedent first disbursement of the loan: The Conditions that were to be met before first disbursement were 6 that include: (1) Constituted, to the satisfaction of the Fund, a Project Implementation Unit (PIMU) (2) Establishment of the Steering Committee (3) Establishment of a Land Allocation and Adjudication Committee responsible for formulating allocation criteria for each of the five villages, constituting Madibira Ward; (4) Provide evidence that a valid water rights certificate in respect of the Project has been issued or granted; (5) Given an understanding that not later than three months of the loan effectiveness, the Government will commence repair works on the Mafinga-Madibira-Rujewa Road to ensure smooth transportation of farm inputs and outputs (6) Given an understanding that not later than three months of the loan effectiveness, the Government will submit to the Fund for review and comment a mechanism for cost recovery from the beneficiaries of Smallholder irrigation projects financed from public funds. The Government submitted the papers to the Bank in regard to fulfillment of Conditions number 5 and 6but no action was taken. It was difficult to fulfill the two conditions because there was a need for intensive inter-ministerial consultations and even parliament before a decision could be reached.

4.3.3 Other Loan Conditions: The other conditions were (1) Ensure that at the end of the land allocation exercise, at least 30% of the smallholders will be women; (2) Ensure that: (i) not later than 3 months from the date of effectiveness of the loan, an undertaking of a 99 year to NAFCO over project Land has been revoked; (ii) at the end of completion of construction of irrigation works, the project land has been transferred to the participating villages; and (iii) at the end of project implementation, project Land has been allocated to the villagers; (3) give an undertaking to cause the National Environmental Management Council to periodically monitor the environment of Madibira Smallholder Agricultural Development Project; (4) not later than three years from the date of effectiveness of the loan, provide the Fund with an acceptable procurement of inputs, milling and marketing of farm output to the Cooperative Society; (5) not later than two years from the date of effectiveness, of the loan, provide the Fund with an acceptable agreement between the Cooperative Society and PIMU relating to cost recovery; (6) not later than three years from the date of the loan effectiveness, submit to the fund, for its review and comments, draft Memorandum and Articles of Association for the creation of Cooperative Societies; (7) not later than two years from the date of effectiveness of the loan set up a Revolving Fund to be managed by the PIMU. At the end of the fourth year of project implementation, transfer the said fund to cooperative societies on terms and conditions acceptable to the Fund. During the course of implementation of the project, the Bank reached an agreement with the Government to facilitate the farmers to open savings and credit cooperative society and not to use the PIMU as stated in condition number 7.

4.4: Financial and Economic performance

4.4.1 Review of Financial and Economic Projections at Appraisal

4.4.1.1 During appraisal, both financial and economic performance were assessed based on rational projections with respect to the scope of operations of the irrigated agricultural component over a 20-year period, beginning from the first day of investment. The price levels, production values and costs estimates used in calculating the Financial Internal Rates of Return

of 9.37%, and an ERR of 12.44% seem to have been appropriate at that point in time. However, some of the major assumptions and hypotheses are now debatable because, from hindsight, it is evident that they have deflated income and inflated costs and thereby distorted the ratios downwards. The appraisal ratios were estimated on the basis of the following assumptions:

- Double cropping by alternating rice and beans, with per-hectare yields of beans pegged at less than I tonne and that of rice pegged at 4 tonnes with farm gate prices pegged at Tshs 80 and Tshs 110 per kilo of beans and paddy rice, respectively.
- Medium application of chemical fertilizer and pesticide constituting 15%-20% of total operating costs for beans and rice, respectively.
- Full investment outlay of UA 26.3 million or Tshs 11.6 billion costed to paddy rice production at an exchange rate of UA1 = Tshs 441 in 1995. This overvaluation of the local currency (which has now attained Tshs 1,625 in 2003, was compensated for by adjusting costs upwards with a conversion factor of 0.5, but was not sufficiently reflected in estimating the import parity farm gate prices. Thus cash flows were deflated resulting in lower ratios.
- Negative cash flows during the investment years from PY1 (1995) to PY5 (1999) constituted 20% of the total service life of 20 years. Yet the project service life over 20 years was not extended to compensate for them. (i.e. from 1999-2019). Thus the declining marginal efficiency during the 6 crucial years of investment seriously distorted the calculations of both the financial and economic ratios. This alone, reduced the FIRR and particularly, the IERR at appraisal by up to 40%.

4.4.2 Financial results at project completion

4.4.2.1 Currently, the approximately 3,000 farm enterprises that have emerged as a result of the project, operate on the basis of individual decisions in terms of the choice of rice variety and marketing-decision-making. Consequently, the "business conglomerate" experience some slippages mainly in terms of production synchronization, business data generation and the harmonization of prices (as farmers sell to different merchants at different market prices and at different times).

4.4.2.2 Compared with appraisal projections, market prices have attained expected levels of Tshs 150 per kilogram of rice in 2002/2003, albeit with some unexplained variations. Unfortunately, the level of managerial competence of farmers, which was not a critical assumption during appraisal, continues to be a limiting factor. For example, MAMCOS is not yet capable of producing accurate profit and loss statements. It is also not yet capable of providing the leadership necessary for maximizing productivity and profitability. Thus the summary of the income and expenditure statement and crop budgets used in this report are based on reported average market prices over the past three years (2001, 2002, 2003) **(**Annexes 2A and 2B) by the project. In order to recalculate the FIRR, all prices have been adjusted to 2003 prices. Also, replacement costs for the short-lasting tertiary canals have been integrated into the operating costs under the heading of a compulsory "user-fee" of 30,000 per hectare, considered as an operational cost by MAMCOS.

4.4.2.3 Based on these assumptions, the FIRR has been re-estimated at 13%, (annex 2C*)* which compares favourably with the estimate of 9.37% determined during appraisal. Even though this figure appears to be high, it is quite low with respect to industry standards. Thus with double cropping, or major productivity and price improvements, the FIRR can be significantly improved. For example, simulations reveal that by adopting a rational strategy of efficiently utilizing the crop residues for animal fattening, the FIRR could attain 25%. However, if yields should fall consistently below 5 tonnes, or paddy rice prices below Tshs 140 per kilogram, or if operating costs should rise abruptly due to the need for high doses of fertilizer,

then the enterprise will incur substantial financial losses and the FIRR will drop below 9%. Since the probability of occurrence of these conditions is significant, it is therefore crucial to take immediate measures to scale up and diversify opportunities for productivity enhancement and profit maximization (double cropping, mixed farming, and high value crops).

4.4.3 Economic performance

4.4.3.1 During appraisal, the economic analysis determined an ERR of 12.4%. This figure is quite moderate because of the assumptions cited in 4.4.1.1 above. The re-estimation of IERR **(**annex 2D**)** revealed a ratio of 18%, which is more positive than the appraisal ratio of 12.4%. The calculations utilized shadow values that reflect the true opportunity costs of the resources invested. It took into consideration the total annual loan disbursements as the investment costs and used shadow exchange rates calculated on the basis of annual weighted exchange rates for each year to determine the economic prices. Furthermore, all labour and operating costs were converted to their economic values using a conversion factor of 0.9 (instead of 0.5 at appraisal). This choice reflects the fact that by 2002, the economy has been sufficiently liberalized to the extent that there are currently minimum comparative distortions in local prices and costs. The project service life of 20 years assumed during appraisal has been retained. However, assuming 1999 as the first production year,(1995-1998 being essentially the investment years), the 20-year-life-span extends up to 2019. Also, replacement costs (mainly for canals and other irrigation infrastructure) were integrated into operating costs in line with the MAMCOS policies, which charges a compulsory user fee per farmer during each cropping season to constitute irrigation maintenance, replacement and other charges.

4.4.3.2 Further analysis reveals that the divergence between the Tshs 150 per kilogram actual market price and Tshs 352 economic price results from both market-induced and policy-induced factors. The difference of Tshs 202 per kilogram of paddy offers a potential for generating Tshs 2 billion or US$ 2million of “transfer benefits” or “fiscal impact” on the economy each year. These benefits accrue to a multitude of middlemen, millers, merchants, retailers, transporters, and finally, the consumers and the government. Consequently, because of its long pay-off period, the project demonstrated a good potential of generating a high stream of surpluses for further investments. It significantly contributes to the present and future net flows of goods and services in the economy, for consumption, investment and poverty reduction. It can, therefore, be rated as a positive investment of public funds.

4.4.4 Financial Performances of Micro Enterprise Cooperative:

The Performance ratios for M-SACCOS reveal that as a young micro-finance cooperative, that received seed money amounting to Tshs 600 million, (UA 565,000) from ADF loan has started off on good ground by keeping expenditures low and maintaining a strong liquidity position (Refer to annex 2F).

5 SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS

5.1 Socio-economic impact

5.1.1 **Impact on Poverty Reduction:** The economic analysis reveals that MSADP is contributing effectively towards poverty reduction and household food security. Increases in cereal production have already turned the Madibira Ward from a zone with 140 tonnes of cereal deficit in 1998, to a cereal surplus zone in 2002 with the capacity of supplying other zones with 9,000 tonnes of cereal. Over the past 2 years the project has injected funds of about Tshs 1.5 billion (US$ 1.5 million) each year, into the local economy and generated direct and indirect

employment opportunities for over 6,000 seasonal workers including 40% women. In addition each of the participating 3,000 farmers currently sets aside enough cereals after each harvest to satisfy household cereal security. Key indicators of poverty reduction outputs accomplished between 1996-2003 include:

- Increased number of burnt brick modern houses constructed from 122 to 1,151
- Increased school enrolment from zero to 2 nurseries; and zero to 1 secondary school
- Increased access to potable water for all 28,000 inhabitants of the Ward
- Increased number of owners of electric generators from zero to 32 and owners of solar panels from zero to 13
- Increased owners of motorcycles from 8 to 23.
- Increased owners of tractors from 4 to 15 and power tillers from zero to 40
- Increased owners of milling machines from 8 to 53
- Increased owners of retail shops from 2 to 80 and wholesale shops from zero to 11
- Increased number of day nurseries from zero to 2
- Increased access to health services through construction of the health clinic.

5.1.2 The foregoing signifies encouraging trends of poverty-reduction and confirms the presence of private sector initiatives, which promise to be sustainable with the support of the rural micro finance credit provided by M-SACCOS.

5.1.3 Impact on Rural Infrastructure: The 17 wells and 5 boreholes of water constructed, facilitate year-round access to pipe-borne water within 30 minutes return trip to all villages, while the 8 dispensaries, including one constructed by the project, and village drug stores assure access to health services. Similarly, 112 kilometres of feeder roads have been rehabilitated and have improved mobility between villages and access to markets.

5.1.4 Impact on Incomes of Farm families: All of the 3,000 farmers of the scheme continue to maintain their rain-fed cereal production mainly for subsistence. In addition, each farmer earns net incomes of between Tshs 360,000-400,000 annually from rice production to supplement household incomes. Also, a total of 1,135 farmers and other small entrepreneurs including 36% women received average loan amounts of Tshs 200,000 in the 2002/2003 cropping season. These loans serve to cover operating costs. They have also facilitated the proliferation of entrepreneurs and service providers, leading to the creation of a local exchange economy and contributing gradually towards the creation of a critical mass for sustainable development. Preliminary investigation of M-SACCOS records reveal a positive correlation between the 1,135 borrowers and the approximately 1,100 farmers reporting signs of wealth accumulation and improved quality of life.

5.1.5 Gender sensitivity: Paddy rice production on small-irrigated plots is reputed to be one of the highest labour-intensive agricultural enterprises in sub-Saharan Africa. Findings in Madibira confirm that the tendencies of exploiting the labour of children and women in the production processes have been significantly minimized through heavy dependence on hired labour for transplanting, weeding, bird-scaring, harvesting and threshing, which constitute approximately 50% of total operating costs or Tshs 185,000 per hectare. Similarly, tractors and power tillers are available in sufficient numbers to replace tedious manual labour related to land preparation and transportation. Furthermore, men and women have equal opportunity towards ownership and control over productive resources. Other indicators of transformed relationships and gender sensitivity include the fact that men, women and children all equally enjoy the benefits accruing from the project. The mushrooming of new houses, electric generators, bicycles, shops, drug stores, potable water and milling machines, just to mention a few, testify to improved quality of life for all. The planting of fruit trees around homesteads would contribute to child and maternal

nutrition in the near future as fruits become abundant. The building of a health clinic, 2-day nurseries, a secondary school and other facilities reveal the importance that the community accords to child and maternal welfare issues.

5.2 Environmental impact

5.2.1 At Appraisal, the project was classified as category I. The envisaged negative environmental impacts which are typical for irrigation schemes included: (i) increase in water borne diseases, (ii) pollution in water quality from agro-chemical use, and (ii) the disruption of swamp habitat down stream as a result of water quality deterioration.

5.2.2 Based on the forecasted negative impacts, a selective re-forestation program coupled with an effective wildlife protection was made part of the project design to help maintain the ecological equilibrium. To address the negative impacts, the project was to construct and equip the laboratory for monitoring environmental activities, construct a health clinic; re-forestate 500 ha, distribute 450 wood-energy saving stoves, and provide seedlings to the participating farmers. The laboratory would be well equipped and necessary chemicals provided for testing soil nutrients, monitoring of irrigation water quality and agro-chemical residues in drainage water. The health clinic is used for timely treatment of illnesses, as well as monitoring disease-outbreaks.

5.2.3 The project has developed a relatively high degree of awareness for conserving natural resources through establishment of community nurseries, distribution of over 100,000 tree seedlings, reforestation of about 200 ha of degraded land along the ndembera river and other degraded spots within the project area, as well as distribution of 200 wood-saving stoves. There was no evidence of negative impacts from the use of agro-chemicals on the soils and water sources during project implementation because farmers were not using fertilisers yet in their plots as soil tests did not reflect the need for fertiliser application.

5.2.4 Notwithstanding, the above, the Government and local communities must do more to meet various environmental demands and pay greater attention to health services. Continued deforestation, overgrazing and lack of protection of the catchment areas that empt their water into Ndembera and Mwima Rivers pose a threat to the sustainability of irrigation in the project area. Another cross cutting issue that needs urgent attention is the high incidence of HIV in the project area. It is reported that between January and November 2002, 24 people died from HIV related diseases.

6 PROJECT SUSTAINABILITY

6.1 Through the efforts of MAMCOS and M-SACCOS, the communities are working seriously to constitute a dedicated and conscientious, hardworking labour force. These initiatives must be consolidated to foster sustainability through continued capacity building of MAMCOS.

6.2 The Government has put in place the institutional capacities required for the development of a sound and sustainable community development ie, MAMCOS and M-SACCOS. In addition, an enabling environment has been establishment through the Ministry of Cooperatives and Marketing that has developed strategies to strengthen the regulatory environment for cooperatives and micro-financing institutions and improve marketing of inputs and outputs. Furthermore, the Mbarali district has made provisions in its 2004 budget to provide extension services and train community focal point extension workers (through on farm trials, farmers' field schools etc.) up to June 2007. The user fees paid by the scheme farmers for maintenance of irrigation infrastructure will be able to cover some of the cost of specialised service providers.

6.3 For the project's achievements to be fully sustained and long-term gains realized, there is a need for construction of water conservation structures and watershed management. The Government is urged to look for funds for water harvesting and conservation of watershed. The new initiatives by the Mbarali district to promote networking between community institutions in the project area and other counterpart organizations like Development Alternatives Inc. for Private Enterprise Support Activities (DIAPESA) and the African Development Foundation (ADF) NGOs specializing on micro-enterprise development, is highly commended. Such ventures as they will further promote development in the scheme and in the entire district as whole.

7 PERFORMANCE OF THE BANK AND THE BORROWER

7.1 Bank Performance

As stipulated in the loan agreement, the Bank's performance covered the field of supervision and quality assurance for effective loan utilisation, and performance and compliance in reporting. In all 12 supervision and follow-up visits were conducted between 14th March 1992 and 16th November 2002. These visits assisted the PIMU to resolve problems encountered and to keep the project on track with regard to timely implementation of activities and reporting. The average annual frequency of supervision is 1.7 over the project life cycle. This compares favourably with the Bank Group recommendation of 1.5 supervisions per year. Bank's performance is rated satisfactory.

7.2 Borrower's performance

7.2.1. The Borrower was able to implement almost all activities needed for achieving project objectives except the rehabilitation of the Mandibra-Rujewa road that the Government could not implement due to budget constraints. However, the Government was able to include the rehabilitation of this road under the ADF Tanzania Agricultural Marketing Systems Development Programme that was approved by the Board on 18 September 2002. Furthermore, major policies, which supported project objectives were issued during the course of project implementation. The major policies issued include Agriculture and Livestock Policy of 1997, National Poverty Eradication Strategy of 1998, and the Tanzania Development Vision of 1999. These policies, amongst other aspirations, all aim at achieving poverty reduction in Tanzania.

7.2.2. There were few occasions when payments by the GOT to the civil works contractor were not on schedule. The delays had negative impact on the Government as it had to pay interest as a penalty on one of the civil works contract. Nevertheless by project completion, the Government had accomplished 104.06% of its counterpart contribution obligation. Procurement was done in compliance with the stipulations of the loan agreement. Reports, including work-plans and budget, quarterly and audit and annual reports were submitted timely. Overall performance of the Borrower is rated satisfactory.

8 OVERALL PERFORMANCE AND RATING

In accordance with the project outcome ratings (Anne5), the overall assessment of project performance is 2.5 out of 4 maximum. Through the joint efforts of the Government, PIMU and other local stakeholders, the project delivered results that average over 90% against planned outputs. It has also satisfactorily accomplished its objectives of poverty reduction through access to basic social services, increased household food security, enhanced incomes, and general improvements in the quality of life, as evidenced by the increase in the construction of modern houses. One of the noticeable spill-over impacts in the project area is the flourishing private

sector that is evidenced by procurement of 40 power-tillers, 58 grinding machines, 32 power generators, 8 solar heaters and opening of 80 retail shops and 8 wholesale shops by members of the beneficiary community.

9 CONCLUSIONS, LESSONS LEARNT & RECOMMENDATIONS

9.1 Conclusions

9.1.1 The overall outcome of the project is rated satisfactory. Most of the targets set in the project objectives have been achieved and in some cases the targets were exceeded. For example provision of safe drinking water was exceeded by 340%. Physical aachievements by components are estimated at 97% for irrigation and drainage infrastructure, 98% infrastructure and services, 90% development of agricultural activities, 70% environment and 99% project management. Establishment of functioning community scheme institutions, MAMCOS and M-SACCOS is critical for sustaining project activities.

9.1.2 The project has been successful in addressing some major elements of poverty reduction in the five villages of the project area. These include, provision of credit, access to potable water, enhanced access to basic health facilities and curative care, increased household incomes as evidenced by increased school enrolment, improved mobility (bicycles, motorcycles and vehicles,) and increase in construction of modern houses from 122 without project and to 1,150 with project. The project beneficiary community has built their own secondary school and two pre-schools.

9.1.3 The professional skills required to change the individually-owned-one-hectare plots into a professionally managed businesses of 3,000 hectares constitute a major challenge that can only be tackled through effective networking and management of the scheme, and also, active support from district authorities. Consequently, the scheme management team needs more logistical and financial support to carry the project through its crucial phases of post implementation and consolidation of ownership of activities by the communities.

9.1.4 The economic and financial performance of the project are considered strong and fully justify investments on the project.

9.2 Lessons learnt

The major lessons learned from the implementation of the MSADP include: -

9.2.1 The well defined population of about 20,000 people out of which 3,000 farmers participated in project implementation, formed and became members of MAMCOS and the majority also became members of M-SACCOS, has turned to be the best practice for reducing poverty in a short term. The critical mass of active farmers' participation in market oriented agriculture and related business types, such as power-tillers and tractors for hire, made it possible for spontaneous boom of income generating activities in the project area. The PIMU of both national and international staff that was located on the project site is another best practice for timely implementation of development projects. This arrangement, enabled officers to concentrate more on project issues (5.1.1).

9.2.2 Success of project performance is associated with the degree of Government support, training and participation of the beneficiaries/stakeholders in project implementation. These were some of the major factors contributing to positive performance of this project (4.2.1).

9.2.3 It is not feasible to transfer capacity to the communities simultaneously in terms of production and marketing functions, particularly at an early stage of the project life cycle. A more efficient approach would be division of labour whereby, farmers specialize in aspects of production, while the more complicated marketing components like the management of a large rice milling plant and marketing of large quantities of rice, are handled by other by other segments of the private sector (4.2.3).

9.2.4 The appraisal arrangement that obliged the GOT to provide matching funds for civil works contracts resulted in implementation delays and penalty charges to the Government due to budgetary constraints. A better arrangement would have been for the Government to pay staff salaries, while contracts are paid exclusively using ADF funds. This would have been a more sustainable approach that would have also avoided staff movement at the end of the project investment period (2.3.2).

9.2.5 Low cost labour contributions imposed on communities do not always yield sustainable results. In the case of this project, the tertiary canals built by the communities using manual labour without mechanical compaction severely compromised sustainability and will require high maintenance costs in the future (4.1.2.1).

9.3 Recommendations.

To the Bank

9.3.1 It is not feasible to transfer capacity to the communities simultaneously in terms of production and marketing functions in irrigation projects because of the initial time (2 to 3 years) required for the development of physical irrigation structures. Therefore, due to the inherent requirement of sequencing activities in irrigation projects, project duration should be more than five years in order to allow time for implementation of technical activities and capacity building of the beneficiaries (4.1.4.1).

9.3.2 Targets for women participation in project activities should be set out during project design in order to ensure their effective participation in sufficient numbers. This project actively involved the participation of women (35%) in all activities because during appraisal, a target of 30% participation by women in all activities was set (4.3.3).

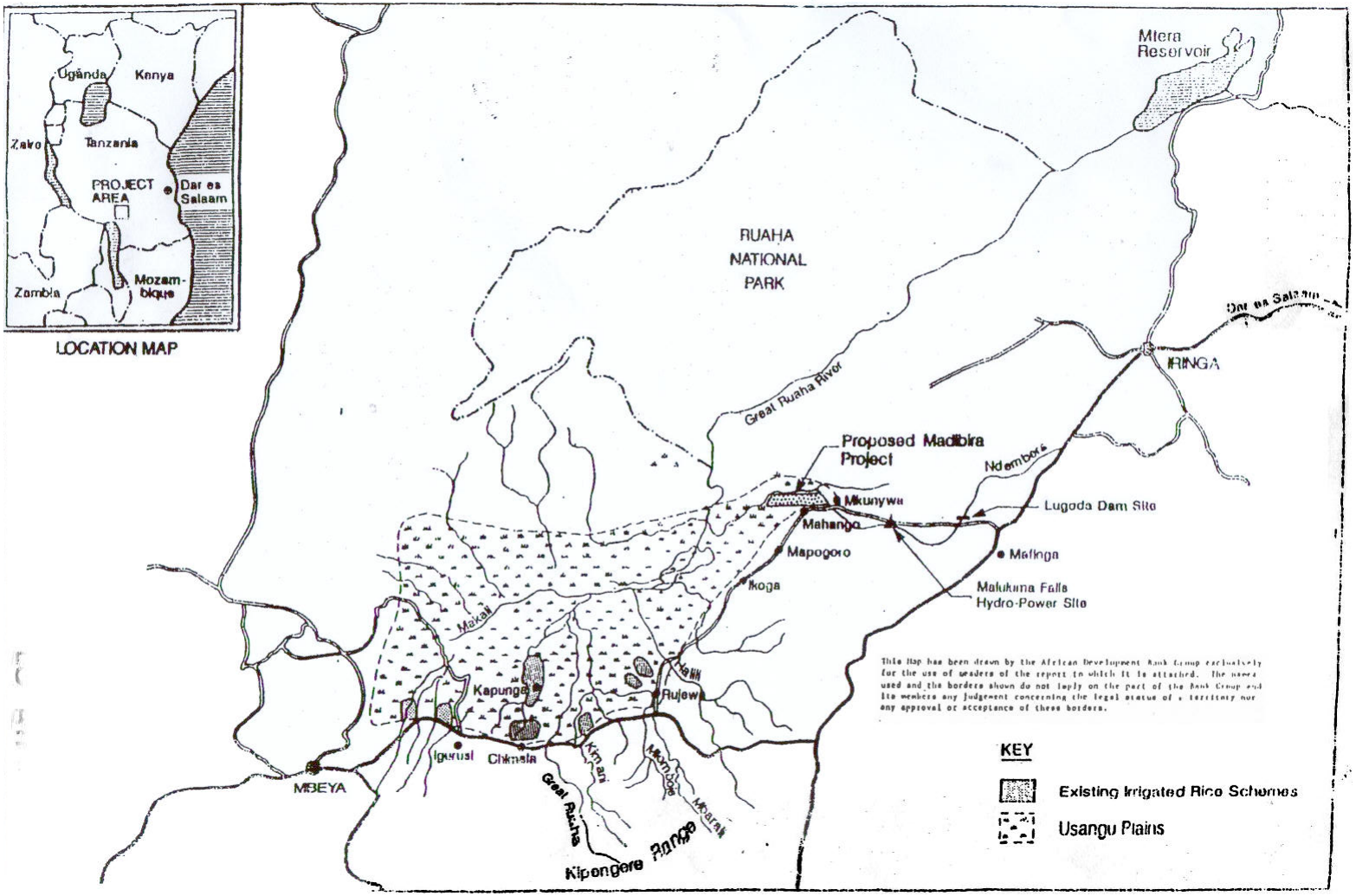
To the Government

9.3.3 Consolidate existing accomplishments: This requires capacity building and extension support for improving production, productivity, marketing and business information gathering functions. It also includes the required prompt actions for privatising the rice mill and empowering the communities and the community-based organizations to share increased responsibilities with respect to project management and monitoring. Furthermore, Government resources are needed to support operational and transport costs of scheme management (4.1.4.3; 6.3).

9.3.4 Expand options for scaling up the facilities: This should focus on initiatives designed to increase the water retention levels required to cultivate a second crop in the year. It should also enhance diversification, marketing, information gathering and networking initiatives in order to build leverage for the sustainability of the activities (6.3).

ANNEX 1

PROJECT LOCATION MAP



ANNEX 2A

PER HECTARE ENTERPRISE BUDGET FOR IRRIGATED PADDY RICE

(REFLECTING THREE MOST POPULAR VARIETIES AND THREE PRICE LEVELS)

ASSUMPTIONS: 1) HIGH SOIL FERTILITY: 2) GOOD AGRONOMIC CONDITIONS, 3) ALL 3000 FARMERS PARTICIPATE FULLY AND GROW THE SAME PADDY VARIETY 3) ALL 3000 FARMERS HAVE AVERAGE MANAGEMENT SKILLS

	ITEM	Paddy Yield Tonnes	Paddy Price Tshs	INCOME /COSTS ('000 TSHS)		
1:SALES OF VARIETIES						
	Subrimati	*7*	*115*	**805,000**		
	Giza 181	*5.5*	*130*		**715,000**	
	Afaa Mwanza/ Zambia	*5*	*150*			**750,000**
	TOTAL SALES			**805,000**	**715,000**	**750,000**
2	**OPERATING EXPENSES**					
2	Mechanical paddling			50000	50000	50000
3	Mechanical Land preparation			50000	50000	50000
4	Transplanting			35000	35000	35000
5	2 Weeding			80000	80000	80000
6	Bird scaring			20000	20000	20000
7	Harvesting			30000	30000	30000
8	Threshing and Winnowing			50000	50000	50000
9	Bagging			20000	20000	20000
10	Transport/handling			25000	25000	25000
11	User fees paid towards fixed costs (depreciation maintenance and repairs of canals)			30000	30000	30000
12	**TOTAL EXPENSES**			**390,000**	**390,000**	**390,000**
13	**NET CASH FLOW (1–12)**			**415,000**	**325,000**	**360,000**

Note: Yields =Net yields after harvesting loss and household consumption:

ANNEX 2B

FARMGATE IMPORT PARITY PRICE OF PADDY RICE: (MADIBIRA)

PRICES IN (2003 U$D)

ITEM	YEAR					
	1998	***1999***	***2000***	***2001***	***2002***	***2003***
F.O.B Bangkok 6% broken perfumed rice	145	150	200	250	290	350
Freight Insurance CIF Darel Salam	40	40	40	48	48	50
Sub Total U$D	185	190	240	298	338	400
Shadow Exchange Rate[1]	700	750	780	900	1000	1169
Tshs Equivalent per tonne of 6% broken	**129500**	**142500**	**187200**	**268200**	**338000**	**467600**
Tanzania Port Charges/bagging	30000	30000	30000	35000	35000	40000
Transp/handling charges to Madibira	45000	45000	45000	50000	50000	50000
Madibira Wholesale Prices	204500	217500	262200	353200	423000	557600
Local retail distribution/Marketing	6000	6000	6000	6000	6000	6000
Adjustment for loss and shrinkage (5%)	6475	7125	9360	13410	16900	23380
Import Parity @Farm gate per Tonne of 6% broken polished rice	216975	230625	277560	372610	445900	586980
Imp Parity farm gate per kg of Paddy[2]	**130**	**138**	**166**	**223**	**267**	**352**
Actual Market Prices	**110**	**110**	**110**	**115**	**130**	**150**
Economic Margins, spreads and rents	**20**	**28**	**56**	**108**	**137**	**202**

NOTES

[1]Shadow exchange rate = weighted annual average quoted Bank rate
[2]Assuming 60% conversion rate from paddy to polished rice

ANALYSIS OF DIVERGENCE BETWEEN ECONOMIC AND FINANCIAL PRICES

The divergence between the actual market price of Tshs 150 and the economic price of Tshs 352 is due partly to market-induced and partly to policy-induced factors.
The Tshs 295 per kilo of paddy represents a potential for generating Tshs 4.4 billion of transfer benefits or fiscal impact on the economy each year. These benefits accrue to a multitude of middlemen, merchants, transporters, consumers and government.
Consumers, in particular are benefiting from lower prices on quality perfumed rice

The major challenge therefore is to minimize the probability of the deterioration of productivity and profitability in order to prevent further declines in financial farm gate prices from turning into a major disincentive for the producers.

ANNEX 2C

MADIBIRA SMALLHOLDER IRRIGATION SCHEME

PROJECT COMPLETION RE-ESTIMATION OF FINANCIAL INTERNAL RATE OF RETURN

20-YEAR TOTAL PROJECT SERVICE LIFE: (Tshs: 1995 CONSTANT PRICES)

DISAGGREGATED DATA ASSUMING 3000 SINGLE ENTERPRISES PRODUCING HOMOGENOUS PRODUCTS

Year	Inv.Costs	Average Yield/ha	Total ha Cultivated	Av. per kg Price/paddy	Gross Inc Per ha	Per ha Op cost	Cash Flow per ha	
1995	97604	0	0	0	0	0		**-97604**
1996	219058	0	0	0	0	0		**-219058**
1997	2297	0	0	0	0	0		**-2297**
1998	1548870	4	450	110	440000	562457		**-1671327**
1999	390625	4.5	1827	120	540000	449673		**-300298**
2000	177902	4.9	2500	120	588000	200000		**210098**
2001	134299	5	2200	150	750000	390000		**225701**
2002	70703	5	2750	150	750000	390000		**289297**
2003		5	2750	150	750000	390000		**360000**
2004		5	3000	150	750000	390000		**360000**
2005		5	3000	150	750000	390000		**360000**
2006		6	3000	150	900000	390000		**510000**
2007		6	3000	150	900000	390000		**510000**
2008		6	3000	150	900000	390000		**510000**
2009		6	3000	150	900000	390000		**510000**
2010		6	3000	150	900000	390000		**510000**
2011		6	3000	150	900000	390000		**510000**
2012		6	3000	150	900000	390000		**510000**
2013		6	3000	150	900000	390000		**510000**
2014		6	300	150	900000	390000		**510000**
2015		6	300	150	900000	390000		**510000**
2016		6	300	150	900000	390000		**510000**
2017		6	300	150	900000	390000		**510000**
2018		6	300	150	900000	390000		**510000**
2019		6	300	150	900000	390000		**510000**
					IRR	**13%**		

Notes:

1: Farmers pay for land preparation and maintenance costs. They contribute owner's labour and hire supplementary labour towards harvesting, transportation, and other labour-intensive costs.

2. The IRR reflects the marginal efficiency of capital. Hence its is biased because of the huge initial capital outlay that is susceptible to declining marginal productivity in the short term

ANNEX 2D

MADIBIRA SMALLHOLDER AGRICULTURAL DEVELOPMET PROJECT

AGGREGATED DATA

TSHS 000 CONSTANT 2003 PRICES

PROJECT COMPLETION RE-ESTIMATION OF THE INTERNAL ECONOMIC RATE OF RETURN

ITEM	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005-19
Production tonnes/ha kilos/hectare	0	0	0	4000	4000	5000	5000	5000	5000	5000	5000
Farm gate Imp. Parity Price/kg	0	0	0	130	138	166	223	267	352	352	370
Gross Income/ha	0	0	0	520000	552000	830000	1115000	1335000	1760000	1760000	1850000
COSTS											
Operating Costs	0	0	0	166666	222222	222222	433333	433333	433333	433333	433333
Total Investment Costs	325046400	789582300	4825399600	7730037900	2166132000	1183821600	968146400	548899400	0	0	0
Investment Costs/ha	108348,8	263194,1	1608466,53	2576679,3	722044	394607,2	322715,47	182966,467	0	0	0
Total Costs	108348,8	263194,1	1608466,53	2743345,3	944266	616829,2	756048,47	616299,467	433333	433333	433333
Net Benefits	**-108348,8**	**-263194,1**	**-1608466,5**	**-2223345,3**	**-392266**	**213170,8**	**358951,53**	**718700,533**	**1326667**	**1326667**	**1416667**

IERR 18% NPV Tshs 3.5 Billion

Notes:

1) Assumes 10% Discount Rate
2) Sales prices based on import parity prices calculated with shadow exchange rates adjusted for local currency over valuation
3) Operating and labour costs estimated on the basis of conversion factor of 0.9.

ANNEX 2E

SUMMARY ESTIMATES OF INCOME AND EXPENDITURE FOR THE OTHER SUB COMPONENTS (Source Government PCR)

Profit Centre	Total income	Operating cost	Net Income before taxes
1.Rice mill	1,410,500,000	1,289,750,000	120,750,000
2. Farm machinery	134,268,037	118,754,004	15,514,033
3.Heavy machinery	96,936,009	86,680,647	10,255,362
4. Workshop	120,081,050	115,608,801	4,472,249
5. Management	0	105,456,000	(105,456,000)
6. Irrigation	163,350,502	163,350,502	0
Total	**1,925,135,598**	**1,879,599,954**	**45,535,644**

Source: Government PCR

Note: The above sub components were not taken into consideration in calculating the financial and economic ratios for the following reasons:

- Sub component 6 is now fully transferred to MAMCOS and integrated into the paddy enterprise under user fees.
- Sub component is currently being funded by the GOT and is also progressively being transferred to MAMCOS and M-SACCOS
- Sub components 2,3 and 4 currently experience declining incomes due to aging equipment and strong competition from the private sector service providers (power tillers, tractors, etc)
- The only viable sub component or profit centre capable of generating profits and cash flows over the next 20 years is the Rice Milling Plant., which needs to be privatised and managed differently to remain viable.

ANNEX 2F

FINANCIAL PERFORMANCE OF CO-OPERATIVES
M-SACCOS PERFORMANCE AND PROFITABILITY ANALYSIS
(AS AT JUNE 2004)

PERFORMANCE INDICATORS	DEFINITIONS	RATIOS
Current Ratio	Current assets/ current liabilities	**179%**
Debt/ Equity Ratio	Total liabilities/Total equities	**0.5%**
Return on Equity	Net Operating Income/Average Equity	**3.2%**
Return on Assets	Net Operating Income/ Average Assets	**3.2%**
Operational Self Sufficiency	Total operating income/ Total Operating Expense	**210%**
Loan Loss Reserve		**2.2 Million**
Financial Self Sufficiency	Adjusted operating income/ Adjusted operating expenses	**180%**
Profit Margin	Net Operating Income/Total operating income	**53.5%**

MANAGEMENT PERFORMANCE AGAINST ASSETS AND LIABILITIES

Asset Utilization Rate	Total Interest Income/Average performing assets	**4.9%**
Theoretical Portfolio yield	Receivable full loan interest income/ Period average gross loan portfolio	**15.3%**
Liquidity Ratio	Cash plus Current Accounts / Total Assets	**45.2%**
Equity multiplier	Total assets / Equity	**0.9**

LOAN PORTFOLIO RISK ANALYSIS

Portfolio at risk	Outstanding Principal Balance of loans with arrears over 300 days/ Total gross loan portfolio	31.5%
Loan management efficiency	Number of active borrowers/ / Loan officers	1137 borrowers for 0 loan officers Two loan officers will be hired this year to provide on the field business advisory and client supervision ad monitoring
Staff productivity	N° of active clients / N° of staff	1: 284
Write off ratio	Write off of bad loans during period/ period average gross loan portfolio	Zero write-offs. However 1million in bad debts to clients who have either died or left the project area and 82 million to MAMCOS which is delinquent but not written off because MAMCOS has more than 50 million in a savings account
Risk Coverage Ratio	Loan loss reserve/Outstanding loan balances overdue for more than 30 days	220%. However if the controversial MAMCOS loan is considered the ratio is a disappointing 0.2%
Admin expense ratio	Admin expenses/ period average gross loan portfolio	2.7%
Cost per borrower	Admin expenses/Period average number of active borrowers	Tshs 6420
Average disbursed loan size	$\frac{\text{Total amount of loans disbursed}}{\text{Total number of loans disbursed}}$	Tshs 231,000

ANNEX 3

IMPLEMENTATION PERFORMANCE RATING.

FORM IP 1
INPLEMENTATION PERFORMANCE

Component Indicators	Score (1 to 4)	Remarks
1. Adherence to Time Schedule	3	
2. Adherence to Cost Schedule	3	
3. Compliance with Covenants	3	
4. Adequacy of Monitoring & Evaluation and Reporting	2	
5. Satisfactory Operations (if applicable)	3	
TOTAL	14	
Overall Assessment of Implementation Performance	2.8	Category S (Satisfactory)

ANNEX 4

BANK PERFORMANCE RATING

FORM BP 1
BANK PERFORMANCE

Component Indicators	Score (1 to 4)	Remarks
1. At Identification	3	
2. At Preparation of Project	3	
3. At Appraisal	2	
4. At Supervision	3	
Overall Assessment of Bank Performance	2.7	Category S (Satisfactory)

ANNEX 5

PROJECT OUTCOME RATINGS

FORM PO 1

PROJECT OUTCOME

No.	Component Indicators	Score (1-4)	Remarks
1	**Relevance and Achievement Objectives**		
i)	Macro-economic Policy	3	
ii)	Sector Policy	2	
iii)	Fiscal policy	3	
iv)	Finance	3	
v)	Poverty Alleviation, Social and Gender	3	
vi)	Private Sector Development	2	
vii)	Environment	2	
2	**Institutional Development**		
i)	Institutional Framework including Restructuring	3	
ii)	Financial and Management Information Systems including Audit Systems	2	
iii)	Transfer of Technology	2	
iv)	Staffing by qualified persons including turn over, training of counterpart staff	3	
3	**Sustainability**		
i)	Continued Borrower Commitment	3	
ii)	Environmental Policy	2	
iii)	Institutional Framework	3	
iv)	Technical Framework	2	
v)	Technical Viability and staffing	2	
vi)	Financial Viability including cost recovery systems	3	
vii)	Economic Viability	3	
viii)	O&M Facilitation (availability of recurrent funding, foreign exchange, spares parts, workshop facilities etc.	2	
4	**Economic Internal Rate of Return**		
	TOTAL	49	
	OVERALL ASSESSMENT OF OUTCOME	**2.5**	**Category S**

ANNEX 6

RECOMMENDATIONS AND FOLLOW-UP MATRIX

Main Findings and Conclusions	Lessons Learned/ Recommendations	Follow-up Actions	Responsibility
Formulation and Project Rationale	The project was well conceptualised and strategies chosen to address poverty reduction were also right.	Phase II is recommended with more emphasis on conservation of watershed management and rehabilitation of degraded sites.	Government to request for a phase II..
Project Implementation	In spite of the initial take-off delays, the overall satisfactory performance can be attributed to the community motivation, empowerment and active Bank supervisions		
Compliance with Loan Conditions and Covenants	All Bank conditions were complied with (including audits and quarterly reporting) except the rehabilitation of the Madibira Rujewa road	Bank Appraisal missions should avoid loan conditions that require parliament endorsement to avoid delays in implementation of projects	Bank
Performance Evaluation and Project Outcome	Rated satisfactory due to the high positive impact of project on poverty reduction.	Consolidation of management of MAMCOS and M-SACCOS activities and management needed	Government and beneficiary communities
Sustainability		Government resources are needed to support conservation efforts, operational and transport costs of scheme management	Government and communities.

Summary of Achievement of each planned output

	OUTPUT	Objectively Verifiable Indicators (OVI)		REMARKS
		Planned	**Actual**	
1.	Development of 3000 ha irrigated farm area	• A 3000ha by 1998.	• 1998/1999 Area completed for irrigation was 1000 Ha • 1999/2000 another 2000 ha completed for irrigation by the Contractor. • 2000/2002 Anthills affected area reclaimed	• Land levelling is required to some areas within farmers blocks and • Filling of existing natural depressions and surfacing of anthills in order to effectively use the whole 3000 hactres.
2.	On-farm irrigation drainage works	•	• Tertiary canals of total length of 63.9 km • Tertiary drains of total length of 63.4 km • 271 Nos of pre-casted tertiary canal structures • 105 Nos of pre-casted tertiary drain outlet box structures	• Due to construction of tertiary canals done by farmers and not a qualified Contractor higher maintenance cost is expected due to excessive leakages resulting from poor compaction.
3.	On-farm roads	• 70km of on-farm roads by year 1997.	• A total of 78.7 Km length of all weather farm service roads completed by the contractor by the end of year 1998 • A total of 19.1 Km length of dry season maintenance tracks • A total of 15.1 Km of all weather principal access roads	• A competent Contractor was engaged- M/s Murray & Roberts in JV with NOREMCO • All roads are in good working conditions
4.	Irrigation infrastructure	• Flood protection dyke approximately 20km long. • Rockfilled diversion weir and controlled intake structure; • Primary canal of approx. 12m3/s capacity and 5.5 km long; • Five secondary canals of total length of about 20km; • Four drainage canals totaling approx. 37km in length; • Land levelling of	• Flood protection dyke of 44.8 Km surrounding the project area • 70m length of Rockfilled diversion weir and gates controlled intake structure completed • A primary canal of 1.2 km concrete lined stretch with capacity of 12 m^3 /sec and 4.55 Km long and 15m wide settling basin to remove water suspended • A 150m long and 15m wide settling basin to remove water suspended sediments before crossing the measuring structure to the irrigation farm. • Primary drains of 49.8 Km long dug along the farm periphery • Six secondary canals of total length 38.75 Km with associate structures • Seven secondary drains of total length 34.15 Km with associate crossing structures • Flood erosion control spurs and rock-bar along diversion	• A competent Contractor was engaged- M/s Murray & Roberts in JV with NOREMCO • All bunds, drains, canals and structures constructued according to specifications and are in good working conditions

		3000ha by smallholder farmers.	channel completed	
5	Improved water supply	• 5 boreholes sunk	• Rehabilitation of 1.0 Km new pipeline of 100 mm dia. Pipes to a storage tank installed to improve water supply to Mkunywa-Mahango water supply system. • construction of 17 Km pipeline for Mapogoro-Ikoga water supply system and six cattle watering points constructed along the pipeline • Construction of new water supply system for Nyamakuyu Village. This includes intake structure, water storage tank of 30,000 litres, 100 mm dia. Main distribution pipes of 6.7 Km and 37 mm dia. dia. pipe of 2.0 Km pipeline to 12 stand-pipe points. • Borehole hand pumps installed in areas out of existing water supply systems as 3 Nos in Ikoga, 2 Nos in Mapogoro, 7 Nos in Mahango and 5 Nos in Mkunywa village. • An overhead water tank with 30,000 litres capacity provided in project office compound and two electric operated borehole pumps for domestic and fire hydrant supply	• A competent Contractor was engaged- M/s Murray & Roberts in JV with NOREMCO • All water supply systems are working in good conditions and have improved the accessibility to potable water supply
6	Health clinic and school buildings Meeting/training centre	• 3 bedroom ward with medical facilities and drugs • 1 training centre	• Modern Dispensary building with two four beds admissions wardrooms, laboratory, examination room, pharmacy and dressing rooms. • Laboratory services are provided for tropical disease diagnosis. • Constant supply of essential drugs and reagents for laboratory analysis • Engaged experienced medical staff • Office, workshop, vehicle & equipments shelter and warehouse buildings	• All buildings constructed according to specifications and are in good conditions.
7	A cooperative society and rural savings and credit scheme.	• 1 registered Madibira cooperative society • 1 rural savings credit cooperative society established	• A legal cooperative society registered on 16th April 1997 under the name of MADIBIRA AGRICULTURAL AND MARKETING COOPERATIVE SOCIETY (MAMCOS) with registration number MBR 460. • Number of members has grown up 3091 to-date with	• Both cooperative societies are fully operational

			1974 males; 1,108 women and 9 institutions, and total cash of more than 34 million Tanzanian shillings, including fees and shares of members. • A legal Savings and Credit scheme have been established under the name of "MADIBIRA SAVINGS AND CREDIT COOPERATIVE SOCIETY (M-SACCOS) registered on 20th April 2000 with registration number MBR 460. • Number of members for M-SACCOS are 1531 comprising of 1007 male, 510 female and 14 groups. More members are expected from the potential farmers in the MAMCOS.	
8	Rice mill	• 1 mill with capacity of 4 tones per hour	• Rice mill machines installed with capacity of 3.5 tones per hour production. • Three generator sets installed with capacity of 3 x 200 KVA and equipped with automatic synchronizing switches.	• All machines and generators are in good working conditions.
9	Environmental construction of laboratory monitoring laboratory	• 1 two roomed environmental laboratory constructed & Equipped	• Two rooms Environmental laboratory building Lab. constructed but not equipped	• due sustainability issue lab. not equipment and chemicals not purchased. Agreed to send samples to Mbeya/Iringa Regional Water quality sections, which are equipped and have constant chemical supplies from Ministry of Water funds.
10	Establish Research and Demonstration farm	• A 50 ha field	• Research and a demonstration farm was established centrally located with the scheme where various technologies were tested viz. Variety evaluation, nitrogen response, weed management and time of planting. • Seven (7) potential high yielding lines/varietis (grain yield ranging 5.0-7.0) identified viz. IR54, Giza 181, line 85, iet 1444, NARO TAC 95-2-96-2, PSBRC 28, Zambia through work done at the Research and demonstration farm, and verified in farms fields.	• Done as proposed and good response from the farmers have been experienced. • Lines/varieties have potential in the scheme.

ANNEX 8

SOURCE OF INFORMATION

AUTHOR	PUBLICATION
Bank Mission, July 2001. Aide Memior	AIDE MEMOIRE/ Technical Supervision of Madibira Small Holder Agricultural Development Project 14 July 2001
CRDB Cooperative Rural Development Bank	Monthly bank Statements from January to May 2004 on Current Account and Savings account balances of M-SACCOS
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Co-operative Audit and Supervision Coop Box 671 DODOMA Tanzania	Audit Report 31st August 2003
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