

AFRICAN DEVELOPMENT FUND

REPUBLIC OF MALAWI

MACADAMIA SMALLHOLDER DEVELOPMENT PROJECT

PROJECT COMPLETION REPORT

**AGRICULTURE AND AGRO-INDUSTRY
DEPARTMENT (OSAN)**

April 2009

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EQUIVALENTS AND ABBREVIATIONS

Currency Equivalents

			PCR (2/2009)	Appraisal (9/1997)
1 UA	=	Kwacha	206.31	24.4071
1 UA	=	US\$	1.46	1.35023
1 US\$	=	UA	0.68	0.73948

WEIGHTS AND MEASURES

1 metric tonne (mt)	=	2,205 lbs
1 metric tonne (mt)	=	1000 kg
1 kilogramme (kg)	=	2.205 lbs
1 quintal	=	100 kg
1 metre (m)	=	3.281 ft
1 foot (ft)	=	0.305 m
1 kilometre (km)	=	0.621 mile
1 square kilometre (km ²)	=	0.386 square mile
1 square kilometre (km ²)	=	100 ha
1 square mile	=	259 ha
1 square mile	=	640 acres
1 hectare (ha) = 0.01 km ²	=	2.471 acres

FISCAL YEAR

July 1 – June 30

ABBREVIATIONS

ADB	African Development Bank
ADD	Agricultural Development Division
ADF	African Development Fund
AEDC	Agricultural Extension Development Coordinator
BLADD	Blantyre Agricultural Development Division
DADO	District Agricultural Development Officer
CAETS	Controller of Agriculture, Extension and Technical Services
DAEO	Divisional Agricultural Extension Officer
EPA	Extension Planning Area
ERR	Economic Rate of Return
FAO	Food and Agriculture Organisation
GoM	Government of Malawi
MAI	Ministry of Agriculture and Irrigation
MFI	Micro- Finance Institution
MIS	Management Information System
MoAFS	Ministry of Agriculture and Food Security
MRFC	Malawi Rural Finance Company
MTR	Mid-Term Review
MZADD	Mzuzu Agricultural Development Division
NSC	National Steering Committee
NRA	National Roads Authority
PCR	Project Completion Report
PIU	Project Implementation Unit
PRSP	Poverty Reduction Strategy Paper
PQR	Project Quarterly Report
RMC	Regional Member Country
TA	Technical Assistance
UA	Unit of Account

EXECUTIVE SUMMARY

1. Project sector goal and objective: The sector goal was to improve the well being of Malawians through poverty reduction, especially among rural people, by promoting broad based and rapid agricultural development. The specific objective of the project was to promote and develop the production of 500 hectares (revised to 1200 at mid-term) of macadamia intercropped with 2,500 hectares of food and cash crops under smallholder production in the project areas. This objective was to be accomplished through the implementation of six components: (i) nursery development; (ii) crop development; (ii) research and extension support; (iv) capacity building; (v) infrastructure; and (vi) project management.

2. Implementation: The project was approved on 15 July 1998 and was to be implemented within a period of 5 years beginning from February 1999 to 30 December 2004. However, actual implementation started in March 2001 and first disbursement by ADF was effected on 24 October 2001. The final disbursement deadline was extended to 30 June 2008. There was a slippage of 3 years and 5 months in the implementation of the project.

3. Physical Achievements: The project met most of its physical targets. These include: (i) the distribution of over 132,000 macadamia seedlings to farmers against a target of 100,000; (ii) the development of 1,320 ha of macadamia trees by smallholder farmers against a project target of 1,200 ha, a performance rate of 110% due to the overwhelming demand from the farming communities to plant macadamia trees after the initial vigorous sensitization campaign by the project; (iii) the establishment of over 320 demonstration plots on farmers fields; (iv) supply of potable water (88 boreholes) to nursery clubs' communities; (v) 3650 farmers trained (organized in 225 groups), (vi) rehabilitation of 83.6 km access roads against a target of 138.7 km; (iv) establishment of 10 demand driven farmers' cooperative societies, and (v) capacity building of staff and other stakeholders.

4. Impact on Development: A number of farmers in the project area have started harvesting from trees planted in 2003 and are selling produce in the local markets. The project has generally impacted positively on the capacity of beneficiaries, including women in the production and marketing of macadamia nuts. The project's infrastructure, namely boreholes, roads and buildings are already impacting positively on the well-being of the beneficiaries. Access to safe drinking water by communities with nurseries is contributing to their increased productivity, while the rehabilitation of access roads is enhancing marketing activities and general mobility in the project area.

5. Loan Utilization and Counterpart Funding: The total loan disbursement as at the date of loan closure was UA 4.38 million or 63.76% of the total loan approved, UA 6.85 million. This leaves a balance of unutilized loan balance of UA 2.7 million. The low disbursement rate was due to the cancellation of the credit sub-component during the course of project implementation. The government of Malawi has since requested the Bank to reallocate a total of UA 1.7 million to the agricultural input subsidy as part of the Bank's African Food Crisis Response. This leaves a balance of UA 760,101.5 to be cancelled.

6 Counterpart Funding: Out of the estimated GoM contribution of UA 0.95 million, UA 0.45 million has been released which translates to a counterpart contribution rate of 47.37%.

7. Sustainability and Viability: The project has introduced significant capacity building in all aspects of macadamia production and accomplished satisfactory levels of community involvement and ownership of the activities. The continued derivation of development of investment gains would depend on the management skills of the macadamia cooperatives which have been established to provide technical and business solutions, as well as social challenges emanating from the macadamia community. For this to happen, there is need for continued capacity building of cooperatives in areas of mobilising farmers, post-handling of macadamia crop, obtaining supplies and accessing markets by the Ministry of Agriculture and Food Security (MoAFS). Furthermore, the cooperatives would need active support from various Government institutions at both local and central levels as well as from the private sector in the areas of market consolidation, in addition to maintaining the infrastructure.

8. Conclusion and recommendation: The Macadamia Smallholder Development Project is rated satisfactory. Most of the targets set at appraisal have been met and in some cases exceeded. The active participation of the beneficiaries and the success of the project demonstrate that rural communities can be empowered as well as used to trigger their own development when provided with basic infrastructure. The project should use the established farmers' cooperative societies and existing local government structure as key sustainability factors for consolidating investment gains. The government has affirmed its commitment to advancing the achievements attained under the project in a sustainable manner. The economic and financial performance of the project remains positive and justifies the investment.

9. A number of lessons have been drawn from the implementation experience of this project. These are: (i) The need to carefully consider the duration of a project such as this one involving tree plants whose gestation period is over 5 years; (ii) The need to adopt parallel financing among categories, as opposed to joint financing. This project adopted joint financing between ADF and GOM. Lack of funds in one account implied that implementation of activities could not proceed according to the work-plans; (iii) The Bank and the Executing Agency supervision missions should be more focused on sustainability issues throughout the implementation period of the project; and (iv) When a project is to be implemented using existing institutions, there is still need for the implementation team to work full-time on project activities.

10 Based on the lessons drawn, a number of recommendations have been made. **Recommendations to the Bank:** (i) more regular Bank supervision with the adequate skill mix is needed; (ii) the ADB Malawi Field Office should take a more proactive role in the supervision of projects; (iii) the Bank should search for more effective ways of ensuring that farmers have access to credit; and (iv) there is need for proper system of financing and sequencing of project activities at design. **Recommendation for the borrower:** (i) GoM should take over the activities of the project and integrate them into its programs for sustainability; (ii) given the weak capacity of contractors and consultants, there is need for more vigorous selection and supervision of consultants and contractors.

BASIC PROJECT DATA

1	Country	Malawi
2	Project Title	Macadamia Smallholder Development Project
3	Loan Number	2100150000673
4	Borrower	The Government of Republic of Malawi
5	Guarantor	The Government of the Republic of Malawi
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)	UA6.85 million	UA6.85 million
1	Interest Rate (Service Charge)	0.75% per annum	
2	Repayment Period	40 years	40 years
3	Grace Period	10 years	10 years
4	Loan Negotiating Date	Not available	
5	Loan Approval Date	June 1998	15/07/1998
6	Loan Signature Date	August 1998	13/01/1999
7	Date of Entry into Force	November 1999	07/11/2000
8	Date of First Disbursement	30/12/2004	26/10/2001
9	Deadline of Last Disbursement	Not available	30/06/ 2008
10	1 UA exchange rate to MWK	24.4071	222.6660

B. PROJECT DATA

1. Project Cost and Financing	----- In UA million -----							
	Appraisal Estimate				Actual Cost			
	F.C.	L.C.	Total	%	F.E.	L.C.	Total	%
ADF	4.75	2.10	6.85	83.4	3.06	1.32	4.38	90.5
GOU	-	0.95	0.95	11.6	-	0.45	0.45	9.3
Beneficiaries	-	0.41	0.41	5.0	-	0.01	0.01	0.2
Total	4.75	3.46	8.21	100.0	3.06	1.78	4.84	100.0
2.	Date of First Disbursement: 26/10/2001							
3.	Initial Deadline of Last Disbursement: 30/12/2004							
4.	Actual Date of Last Disbursement: 30/06/2008							

C. PERFORMANCE INDICATORS

1.	Cost under-run	UA
2.	<u>Time overruns:</u> Slippage on effectiveness Slippage of completion Date Slippage of last disbursement No. of extensions of last disbursement	2 years 8 months 3years 5 months 3years 5 months 2
3.	Project Implementation status	Completed
4.	Institutional Performance	Satisfactory
5.	Contract Performance	unsatisfactory
6.	Consultant Performance	Satisfactory
7.	ERR	<u>Appraisal</u> 14.5% <u>PCR</u> 15.4%

D. BANK MISSIONS

MISSION TYPE	DATE	Composition	Person days
Identification	1994	Study conducted by FAO	N/A*
Preparation	1995	Study report revised by ADF and GOM to re-focus project on smallholder macadamia production	N/A*
Appraisal	March 1996	Agri. Economist/Agronomist/ Environmentalist/ Irrigation Engineer	56
Launching	N/A*	-	
Mid-term review	31 Jan.– 12 Feb. 2004	Agronomist/Forestry Expert	28
Supervision**	14-28.10.2002	Agronomist/Financial Analysts	
Supervision	13-30.06.2003	Agronomist/Financial analyst	
Supervision	05-14.05.2005	Agricultural Economist/engineer	
Supervision	08-22.05.2006	Agricultural economist/Engineer	
Supervision	25.03-05.04. 2007	2 Agricultural Economist	
Supervision	19.11-04.12.2007	2 Agricultural Economist	
Supervision	26.05.-06.06.2008	Agricultural Economist/Engineer	
PCR	February 2009	2 Agricultural Economists/Infrastructure Specialist/Agronomist	56

N/A* Not available

** Most supervision missions were undertaken back to back with other missions and it is therefore difficult to determine the person days for each

E. YEARLY DISBURSEMENT

Year	Appraisal Estimate		Actual (at PCR)	
	Amount UA mil.	(%)	Amount UA mil.	(%)
1998				
1999	1.11	16.21		
2000	1.83	26.71		
2001	2.19	31.97	0.61	13.92
2002	0.72	10.51	0.36	8.21
2003	1.00	14.60	0.24	5.47
2004			0.32	7.31
2005			0.44	10.05
2006			0.58	13.25
2007			1.14	26.03
2008			0.69	15.76
Total	6.85	100.00	4.38	100.00
Un-disbursed balance			2.47	

F: CONTRACTORS, SUPPLIERS AND CONSULTANTS

Name/Contract No.	Task/Activity	Date Contract Signed	Contract Amount
MASDAR International 5000008575	Technical Assistance	31.01.2001	USD1,351,400.00
Mike Appel & Gatto Ltd 5000014683	Motor supply	04.06.2002	ZAR283,246.00
UNDP/IAPSO MIDTERMOLLEN 5000015312	Supply motor vehicles	21.08.2002	JPY4,441,644.00
UNDP/IAPSO MIDTERMOLLEN 5000015640	Supply motor vehicles	26.02.2003	JPY2,441,644.00
Olivet-Malawi-LTD 5000016618	Supply of office equipment	20.05.2003	USD60,029.00
EMC Jatula Associates 5000017180	Consulting Civil Engineer	19.03.2004	MWK14,865,081.59
UNDP/IAPSO MIDTERMOLLEN 5000018584	Supply motor vehicles	23.01.2004	JPY2,323,657.00
Audit Consult International 5000019315	Supply of audit Services	03.06.05	MWK1,200,000.00
Xerographic LTD 5000017948	Supply of office equipment	18.10.2005	USD36,595.37
SFCE Group CFAO 5000017939	Supply motor vehicles	17.10.2005	USD99,490.00
Chitsime Drilling Co. LTD 5000018175	Construction of water boreholes	27.01.2006	USD89,427.37
Central African Drilling Co. 5000018188	Construction of water boreholes	27.01.2006	USD114,149.40
Universal Borehole Drillers LTD 5000019723	Construction of water boreholes	16.08.2006	USD102,262.17
Deans Engineering Co LTD 500021098	Rehab. access roads	05.02.2007	MWK97,810,754.40
Tai Construction Machinery 500021702		16.06.2007	36,851,840.00
Muka Construction Co. 5000220128	Rehab. access roads	20.10.2007	MWK115,000,000.00
Chingelezi Construction Co 500023484	Construction of build.	20.10.2007	MWK36,983,820.00
Wahkong Construction Eng. 500023485	Construction of build.	20.10.2007	MWK65,255,637.00
Graham Carr 500024690	Audit Services	05.09.2007	MWK2,275,600.00

MACADAMIA SMALLHOLDER DEVELOPMENT PROJECT – LOGICAL FRAMEWORK MATRIX

Narrative summary	Verifiable indicators	Means of verification	Assumptions																																
Sector Goal	Appraisal																																		
Poverty reduction and promoting of broad based agricultural development	% increase of food supply % increase of share by smallholders in agricultural sector development	Publications M&E reports	Government reform programme remains on tract Readily available farm inputs.																																
Project Specific objective																																			
Development of macadamia intercropped with food and cash crops through provision of training and capacity building at farmer group level	Increased production of food and cash crops as follows (in Tons): <table border="1" data-bbox="591 644 1160 898"> <thead> <tr> <th></th> <th>1999</th> <th>2003</th> <th>2009 (PCR)</th> </tr> </thead> <tbody> <tr> <td>Macadamia</td> <td>0.0</td> <td>80</td> <td>84</td> </tr> <tr> <td>Maize</td> <td>1,027</td> <td>2,248</td> <td>2,607</td> </tr> <tr> <td>Cassava</td> <td>171</td> <td>388</td> <td>450</td> </tr> <tr> <td>Sweet potato</td> <td>131</td> <td>296</td> <td>343</td> </tr> <tr> <td>Groundnut</td> <td>33</td> <td>62</td> <td>72</td> </tr> <tr> <td>Pulses</td> <td>60</td> <td>125</td> <td>145</td> </tr> <tr> <td>Soya beans</td> <td>105</td> <td>200</td> <td>232</td> </tr> </tbody> </table>		1999	2003	2009 (PCR)	Macadamia	0.0	80	84	Maize	1,027	2,248	2,607	Cassava	171	388	450	Sweet potato	131	296	343	Groundnut	33	62	72	Pulses	60	125	145	Soya beans	105	200	232	Yield records obtained at the respective ADDs. M&E reports Quarterly progress reports	Probability of drought Full participation of the project beneficiaries is assured. Net income of the beneficiaries will remain high.
	1999	2003	2009 (PCR)																																
Macadamia	0.0	80	84																																
Maize	1,027	2,248	2,607																																
Cassava	171	388	450																																
Sweet potato	131	296	343																																
Groundnut	33	62	72																																
Pulses	60	125	145																																
Soya beans	105	200	232																																

Outputs		Planned and actual outputs				
i). Macadamia nurseries established ii). Research & Extension Services Strengthened iii) Diversified smallholder farming system. iv) Boreholes constructed v) Establish farmer groups vi) Residential houses and functional building constructed. Feeder roads rehabilitated.		Appraisal	PCR	Quarterly and annual reports Bank supervision reports	i) Qualified research and extension staff available; project beneficiaries are responsive. ii) Trained staff efficient and accountable to project; improved knowledge on macadamia technology of research and extension staff. iii) Project beneficiaries willing to accept and apply the technology. iv) Qualified contractors available and water table easily available v) Project beneficiaries willing to form groups. ivi) Availability of construction materials. Performance by contractors. Qualified contractors & engineers available; Collaboration between MoAFS and MoW satisfactory.	
		i). Six mother nurseries established 2 in Kasungu and 4 in Mzuzu ADDs; 100 community nurseries established 40 in Kasungu and 60 in Mzuzu	i). Fully implemented as planned.			
		ii) 50 Supervisory and 80 field extension staff trained by 2003	ii) Fully implemented as planned.			
		iii) 500 ha of macadamia trees intercropped with cash and food crops by the year 2003	1,320 ha planted to macadamia trees; target of 500 ha was revised to 1,200 ha at MTR			
		iv) 106 boreholes drilled and functional	88 boreholes drilled and functional, 82 for community nurseries and 6 for mother nurseries			
		v) 100 farmer groups each comprised of 25 members established by 2003	200 farmer groups established by 2003			
		vi) Target was 9 residential houses, revised to 2 at MTR; 6 storage facilities; 138.7 km target revised to 83.6 km access roads.	Construction of 2 houses one completed one not completed; 4 storage shed completed and 2 not completed. 86.3 km of road rehabilitated			
Inputs		(UA million)				
	At Appraisal	%	At PCR	%		
Works	2.36	34.45	1.73	25.26	Accounts records	
Goods	0.56	8.18	0.20	3.00	Bank disbursement records	
Services (Consulting)	2.77	40.44	2.33	34.01		
Miscellaneous (Personnel)	<u>1.16</u>	<u>16.93</u>	<u>0.07</u>	<u>1.02</u>		
Total	<u>6.85</u>	<u>100.00</u>	<u>4.33</u>	<u>63.29</u>		
					Satisfactory coordination among participating ministries by the Executing Agency. Timely recruitment of TA and short term consultants	

1 INTRODUCTION

1.1 The purpose of the present project completion report (PCR) is to inform on the results obtained at the end of the implementation of the Macadamia Smallholder Development Project (MSDP), including its impact on the primary beneficiary communities and the physical environment. The objective of the report is also to draw lessons and to make recommendations for the effective and efficient implementation of on-going and or future operations in Malawi and other regional Member Countries (RMCs).

1.2 In 1993, the attention of the Government of Malawi (GoM) was drawn to the low participation of smallholder farmers in the Macadamia industry. The low participation was attributed to various reasons including lack of technical know-how for macadamia production, lack of a proper market structure, and poor access to existing markets. Research in the country had shown that macadamia was easy to grow and required little maintenance in comparison to traditional cash crops such as tobacco, sugar-cane and coffee. It was further observed from the research trials that the macadamia tree crop could easily be intercropped with annual food crops thus increasing economic return per unit land area. Based on this realisation, the government through the *Agricultural and Livestock Development Strategy and Action Plan* adopted in 1995 decided to actively promote the crop. In 1995, GoM requested the Bank for support for a project to promote Macadamia especially among smallholder farmers. MSDP was designed therefore, to empower smallholder farmers to effectively participate in the macadamia industry with the aim of reducing rural poverty and contributing to the diversification country's exports.

1.3 This PCR reflects the findings of a Bank PCR mission that visited the project area to verify physical project implementation and achievements during the period 26 January to 6 February 2009. It also draws on information from a variety of secondary data sources, including the Government's own PCR, Appraisal Report, supervision, audit and quarterly reports as well as stakeholders' views.

2 PROJECT OBJECTIVES AND FORMULATION

2.1 Project Objectives

The sector goal as defined in the Appraisal Report was to improve the well being of Malawians through poverty reduction, especially among rural people, by promoting broad based and rapid agricultural development. The specific objective was to promote and develop the production of 500 hectares (later revised to 1200) of macadamia intercropped with 2,500 ha of food and cash crops under smallholder production in the project area. The sector goal is still relevant to the current Malawi Growth and Development Strategy 2006-2010, that regards agricultural development as leverage for economic and social development for the rural areas where more than 75% of the population derive their livelihood from agricultural activities. It also fits aptly with the Bank's vision of poverty reduction in RMCs and its 2005 – 2009 Result Based Country Strategy Paper for Malawi.

2.2 Origin and Formulation

2.2.1 GoM's realisation of the potential of macadamia production resulted in the development of a feasibility study on macadamia production that was conducted from 1993 and completed in 1994 by FAO. The study proposed a project to be implemented in two

consecutive seven year periods. The study established a sound basis for expansion of the macadamia industry with the identification of new production areas but did not capture an appropriate strategy for involving the smallholder sector. The formulation of the project had therefore to be postponed until an appropriate strategy for inclusion of the smallholder macadamia farming was found.

2.2.2 In 1995, GoM and the Bank revised the feasibility study report and prepared a revised project proposal. The reformulated project focused on the involvement and empowerment of the smallholder sub-sector, with the emphasis on the enhancement of capacity among farmers and other stakeholders in macadamia production and marketing. The project aimed at improving the welfare of the smallholder capacity through provision of income earning opportunities and increasing foreign exchange earnings of the smallholder agricultural sector through crop diversification.

2.3 Preparation, Appraisal, Negotiations and Approval

A Bank Appraisal Mission visited Malawi in February/March 1996 and prepared an Appraisal Report. The loan was approved on 15 July 1998, while the loan agreement was signed on 13 January 1999 and became effective on 7th November 2000, 27 months after loan approval. The delay was due to the failure of GoM to meet some of the loan conditions in good time.

2.4 Project Description

The project as designed had six components: (i) nursery development; (ii) crop development; (iii) research and extension support; (iv) capacity building; (v) infrastructure; and (vi) project management. A summary of the components with the major outputs is as follows:

- (i) **Nursery Development:** Entailing the establishment of 6 mother nurseries and 100 community nurseries with facilities to produce 100,000 macadamia seedlings.
- (ii) **Crop Development:** Including the establishment of 500 ha (revised to 1,200 ha at mid-term review) of macadamia trees intercropped with food and cash crops, and improvements in the marketing of macadamia nuts infrastructure. It also involved the provision of credit to smallholder farmers through the Malawi Rural Finance Company (MRFC) for the procurement of farm inputs and equipment.
- (iii) **Research and Extension Support:** To enhance participatory research and extension programmes and establishment of farmer-managed demonstration-trials on macadamia clones (320 demonstrations), and integrated pest management (6 demonstrations) which were to be used as training grounds for farmers and their organisations.
- (iv) **Capacity Building:** To train staff at all levels including subject matter specialists, project officers, district agricultural officers and frontline extension staff in all aspects related to macadamia production and marketing. The component also included training of farmers in group dynamism and management of farmers clubs.
- (v) **Infrastructure Development:** Involving the drilling of 106 boreholes at mother and community nurseries, construction of 9 residential houses (revised to 2 houses at mid-term review), plant shades, input supply stores, and rehabilitation of 138.7 km (revised to 91.7 km at mid-term review) of gravel access roads in the project areas.
- (vi) **Project Management:** To coordinate project activities and develop an information system of evaluation and impact assessment.

3 PROJECT EXECUTION

3.1 Loan Effectiveness and Start-up

As noted above, there was some delay of 27 months between loan approval and effectiveness. The project's first disbursement was effected on 26 October 2001 which is 41 months after loan approval due to delay in fulfilling loan conditions by the borrower, and difficulties in communication between the Bank and the Executing Agency.

3.2 Modifications

The following three modifications were made:

- (i) Under the crop development component, the planned project target of establishing 500 ha of macadamia crop was revised upward during the midterm review to a target of 1,200 ha. The initial target of 500 ha was easily achieved during the first three years of project implementation. This was due to the overwhelming demand from the farming communities to plant macadamia trees after the initial vigorous sensitisation campaign by the project. The project was able to increase the number of ha because some activities like credit were dropped from the project (see (ii) below).
- (ii) Under the crop development component, the planned credit sub-component was not established because farmers were unwilling to have the proposed Malawi Rural Finance Company (MRFC) as the credit MFI due to the high interest rates and their loan recovery policies. Efforts to recruit another MFI to administer the credit did not succeed. GoM and the Bank later agreed to drop the credit sub-component.
- (iii) Under Infrastructure, some targets were revised downwards at mid-term review. The revised targets included construction of 2 residential houses instead of 9, and rehabilitation of 91.7 km access roads instead of 138.7 km. The targets of boreholes and storage sheds were maintained. Revisions were necessary because some of the earmarked access roads had already been rehabilitated by other programs and also due to cost escalations.

3.3 Implementation Schedule

The Project Implementation Schedule on page (v) shows that the Board Approval of the loan took place with a slight delay of one month. As already indicated, there were also delays in the loan signature dates and date of entry into force leading to a delay of 27 months. The greatest slippage was in the date of last disbursement which was extended from 31st December 2004 to 30th June 2008. Cumulatively, due to the late start-up of project implementation, the original five-year project period was extended to 9 years and 11 months.

3.4 Monitoring, Evaluation and Audit

According to the Appraisal report, the Monitoring and Evaluation Unit (M&E) of Economic and Planning Division of MoAFS was to be responsible for the projects' M&E exercise. This was to have two components: Management Information System (MIS) and Impact Evaluation and Beneficiary Assessment. At project closure, there was no evidence that MIS was used to systematically capture project information, neither has any impact assessment been carried out. In accordance with the provision of the General Conditions of the loan agreement on submission of reports, the Executing Agency submitted 31 Quarterly Progress Reports and 4 Audit Reports from 2002 to 2005. The audit reports for 2006/2007 and

2007/2008 were however, still outstanding at project closure, a clear sign of lack of compliance by the Borrower.

3.5 Procurement

There were no serious issues on procurement except for long delays in the procurement of civil works. The main contributing factors were: (i) the infrastructure component was not part of the MASDAR contract, the consultant hired to implement project activities on a full time basis, (ii) the delay in project effectiveness which resulted into changes of the original sites and redesigning new roads; and (iii) the EA delayed to procure the planned services of the road's engineer who should have been working on the infrastructure component full time.

3.6 Financing Sources and Disbursement

3.6.1 Financing Resources: The total project cost was estimated at UA 8.21 million. The ADF was to finance 100% (UA 4.75 million or about 57.8% of the total project cost) of the foreign exchange costs associated with each of the project's investment components. ADF was also to provide funds to cover 25.6% of the local costs. The GoM's contribution was for financing 11.6% of the total project cost in local currency while project beneficiaries were to contribute UA0.41 million or 5% for procurement of farm inputs and seedlings. As reflected in Table B on page (v), at project closure, the ADF financed 90.5% while the GoM contributed 9.3% and the beneficiaries contributed 0.2% of the total UA. 4.84 million actually spent on the project. A problem at design relating to financing that was experienced during implementation was the joint financing as opposed to parallel financing of project categories. In this project, a single category was being financed by ADF and GoM. Lack of funds in one account implied that implementation of activities could not proceed according to the work-plan

3.6.2 Disbursement: At the last date of disbursement of 30th June 2008, the total amount of the loan disbursed was UA 4.38 giving a loan disbursement rate of 63.95% and leaving a balance of UA 2.47 million from a total loan amount of UA 6.85 million. This is despite the fact that the project targets were scaled up at mid-term. GoM has since requested the Bank to reallocate from the loan balance an amount of UA 1.7 million to the agricultural input subsidy as part of the Bank's African Food Crisis Response. This leaves a balance of UA 760,101.5 which is to be cancelled.

4 **PROJECT PERFORMANCE AND RESULTS**

4.1 Overall Assessment

Despite the start-up delays, the project overall implementation is satisfactory. MSDP has been successful in meeting its main objective - planting macadamia trees on 1,200 ha. This has in fact been exceeded as the project managed 1,320 ha translating to a performance rate of 110%. The project was able to meet most of its capacity building objectives as a large number of farmers (about 3,650 farmers and 130 Ministry staff) have been trained on various aspects of macadamia production. Furthermore, the project was able to establish 10 farmers' cooperatives societies that should act as engines of sustainability for the project investment gains. Although project's infrastructure development activities have been less successful, characterized by long delays and in some cases poor workmanship, the project accomplished

the sector goal of promoting a broad base of cash crops for the smallholder sector in Malawi. Details of the project outputs and outcomes are as follows.

4.2 Operating Results

Nursery Development Component

4.2.1 The project was to facilitate the establishment of 6 mother nurseries and 100 community nurseries with facilities to produce 100,000 plants. Each nursery was to be provided with one watering point, thus requiring a total of 106 boreholes under the infrastructure component. At project closure, the six targeted mother nurseries and 128 community nurseries had been constructed at locations that are central and easily accessible to farmers. Six nursery managers were recruited to support farmer groups and were complemented by intensified extension service. The nurseries served as points for technical training of farmers and from where farmers accessed seedlings at a minimum cost of MK40/seedlings. Over 130,000 seedlings were grafted and distributed to farmers from community nurseries.

Crop Development Component

4.2.2 The project was to establish 1,200 ha of macadamia trees on 2,500 farms intercropped with food and cash crops, and improve rural infrastructure to provide easy market access for macadamia nuts. The project was also to provide credit to smallholder farmers through MRFC for the procurement of farm inputs and equipment by farmers. From its nurseries, the project managed to distribute seedlings which were planted on an estimated 1,320 ha of land representing project performance of 110% against the **revised** target. It should be noted, however that these figures are based on the number of seedlings sold by the nurseries rather than a physical count of trees in the field, and could therefore be an overestimate depending on the survival rates and replacement of the dead plants. Some farmers, including women have started harvesting from trees planted in 2003 and are getting between 2-3kg/per tree against a potential of 20kg/tree (for a fifteen year old tree).

4.2.3 Credit: The project had allocated some funds (UA 468,000.00) for credit with the aim of assisting farmers who are producing macadamia in purchasing farm inputs in general. As already indicated, this sub-component was not implemented due to difficulties in finding an acceptable institution for credit administration by farmers. While some NGOs were delivering credit at reasonable rates, MRFC which was recommended for credit delivery in the Appraisal Report, was charging interest rates in the range of 45-52%. This turned out to be a major design flaw in the project. With the delay in initiating credit delivery activities, the Government and the Bank agreed to cancel the credit sub-component. Although there are a number of credit options for credit for Macadamia farmers, the lack of a dedicated credit does not portend well for future sustainability.

4.2.4 Marketing: To support the marketing of macadamia, the project provided for the recruitment of a Marketing Expert to advice farmers and help gain markets in Malawi and abroad. The formation of farmers' organisations and the rehabilitation of roads were also to facilitate farmers' marketing activities. The Marketing Expert was recruited in the second year of the project but did not achieve much as there was then no output to market (at project closure, only 84,115 kg of nut-in-shell had been sold). Nevertheless, project beneficiaries had formed ten cooperatives to take advantage of economies of scale, but they were not

sufficiently trained on cooperative management. For long-term sustainability, capacity building for cooperative development will be necessary.

Research and Extension Support Component

4.2.5 Under this component, the project established various farmer-managed demonstrations including 320 clonal trials against a target of 289, 41 intercrop trials, 6 integrated pest management trials and 6 post harvest handling trials. The Bvumbwe Agricultural Research Station trained and assisted the frontline extension staff in mounting the trials. However, the final conclusions and lessons on the trials have not yet been made due to the long gestation period of macadamia trees. In collaboration with the Bunda College of Agriculture of the University of Malawi, the project also initiated development of a nutrition programme in aspects relating to the incorporation of macadamia products into rural nutrition as a means for enhancing rural nutrition and local demand for macadamia nuts. Evidence of the impact of the research activities is readily discernable as most farmers are sufficiently knowledgeable on the management of the Macadamia crop. Farmers picked at random during the PCR mission could explain how to space, prepare holes for planting and pest management, among other activities.

Capacity Building Component

4.2.6 This component involved support to farmer groups, training of field staff, farmers, and subject matter specialists in various aspects related to macadamia production including nursery technology, field tending, nuts harvesting, post-harvest handling and marketing. To achieve the outputs of this component, the project initially mounted an intensive programme of campaigns and sensitisation meetings that resulted into mobilisation of over 252 production groups, against a set target of 125 groups, trained a total of 3650 farmers out of which 40% (1,460) were female farmers, held 18 field days that were undertaken by 814 farmers. The project also organised 7 and 4 study tours for staff and farmers, respectively. The project further developed various training materials and manuals on different subject related macadamia production and marketing. The project also managed to form 10 cooperatives as had been planned at appraisal, but these cooperatives were unable to form an apex body as had been envisaged.

Infrastructure Development Component

4.2.7 The project's targets under this component which were revised at mid-term were met only partially. At project closure, 4 out of 6 storage sheds were substantially completed in Mzuzu ADD while two were not yet completed in Kasungu ADD. The residential house in Mzuzu ADD was almost complete but had outstanding finishes (painting and some fixed furniture). Eighty-eight of the 106 boreholes were drilled. The remaining 18 boreholes were not drilled due to difficulties in finding ground water and high price-variation by the contractor that was rejected by the Government. In total, 86.6 km against a revised target of 91.7 km access gravel roads were rehabilitated, although some sections have since been damaged. The rehabilitated roads have greatly improved mobility in the project area and their impact was manifested in the reduction of transport fares due to the increased number of transport vehicles using the roads. Farmers, especially women, are now able to transport their produce to the market and access social amenities more easily and at a reduced price.

Project Management and Coordination

4.2.8 The project as designed was to be implemented within the then existing institutional framework of the Ministry of Agriculture and Irrigation (MAI). A long term Technical Assistance, MASDAR was recruited to train the ministry staff on various aspect of macadamia production. With no specific person assigned to deal with the day-to-day administrative issues, the MASDAR Team Leader who was also the macadamia production expert, supported the project in administrative matters while project finances were being managed by the account office at the MoAFs. The project design did not include a specific management unit that should have been spear-heading implementation of activities within the existing Government institutions. At the end of MASDAR's contract in February 2004, the EA established a PIU to continue with the implementation of project activities. The PIU comprised a Manager and a Financial Controller. The PIU was being technically supported by two Macadamia Desk Officers, one for each ADD. From the project records, the established PIU did not perform well especially in the areas of financial management and accountability. This led to long delays in the replenishment of project accounts especially towards the end of the project due to poor justification of previous expenditures. This adversely affected project activities and hand-over.

4.3 Institutional performance

As indicated above, the project was designed to be implemented within the existing institutional framework of MAI (now Ministry of Agriculture and Food Security (MoAFS)). At the Ministry level, the office of the Controller of Extension and Technical Services (CAETS) was to coordinate the project activities through a National Steering Committee (NSC) that was to be the principal advisory body for project Implementation. The CAETS was also the chairperson for the steering committee. From the project records, the NSC met five times to oversee project implementation and where necessary take corrective measures. At the ADD level, there was a project implementation committee that included all participating Departments. The District Agriculture Development Officers (DADO) and Subject Matter Specialist were responsible for the implementation of activities at district level. At the grassroots level, the Agriculture Extension Development Coordinators and the Agriculture Extension Development Officers (AEDO) were responsible for implementation of day-to-day project activities. The government recruited six qualified mother nursery managers to assist farmer groups and extension staff in the establishment and management of community nurseries. Overall, the institutional framework was good except for the monitoring and evaluation aspects which did not yield much result.

4.4 Staff Recruitment, training and development

As the staff of MoAFS was not conversant with macadamia production and marketing, MASDAR was competitively retained to provide technical assistance in the form of two long term macadamia specialists and five short term consultants in the areas of training, group mobilisation, gender, marketing and monitoring and evaluation. From the project records and publication of extension training materials as highlighted under item 4.2.8, it would appear that MASDAR did a commendable job in capacity building of staff and farmers in all aspects of macadamia production. In addition, 10 key staff participated in macadamia production courses in South Africa.

4.5 Performance of consultants, contractors and suppliers

The performance of the main consultant, MASDAR Consulting from UK, was as already indicated above, satisfactory. The consultant who was recruited to carry out a credit study performed below expectation, and contributed to the cancellation of the activity. The project contractors for works did not perform well as most activities were delayed beyond project life while some were poorly done. Unfortunately, the client did not in most cases invoke the appropriate clauses in the contracts for remedy. The performance of project suppliers for equipment and goods was generally good.

4.6 Fulfilment of Conditions/Covenants

4.6.1 Conditions precedent to first disbursement of the loan: The Conditions that were to be met before first disbursement were: (i) The roads identified for rehabilitation, as part of the project, to have been included in the National Roads Authority yearly maintenance programme, (ii) Six nurseries managers and two qualified drivers to have been recruited in accordance with the standard Government terms to facilitate the project implementation, and (iii) the two long-term technical assistance staff, the short term consultants on group dynamics, and the short-term training consultant (collectively referred to as the primary consultants) to have been selected. Fulfilment of condition (iii) above resulted in a delay of 2 years and 8 months largely because the EA lacked familiarity with the ADF procedures for procurement.

4.6.2 Other Loan Conditions: The only other condition was that all primary consultants be recruited by the Government and already performing their services. This condition was timely fulfilled.

4.7 Financial and Economic Performance

Financial and economic analyses of MSDP at completion were carried out using data provided by project management and crop budget data collected and or provided by the ADDs. The analysis utilises the incremental benefits framework and assumptions used at appraisal (see Annex 6). The only major variation is the area under cultivation which is varied from the 500 ha envisaged at appraisal to 1, 340 ha realised at project closure. The reworked cash flows for the project shows that total revenue will grow from MWK 0.86 million in 2009 to MWK 54 million in 2015 and steady thereafter. Household cash income will increase from MWK 12,800 in 2009 to MWK45, 600 in 2015. The Economic Rate of Return (ERR) of the project is re-estimated at 15.4%, which is a slight improvement to the 14.5% estimated at appraisal. The low ERR reflects in part the long gestation of the Macadamia tree and inability of the project to seriously promote the inter-cropping which was originally assumed. Overall, the project is still economically viable.

5 SOCIO-ECONOMIC AND ENVIRONMENTAL IMPACTS

5.1 Socio-economic impact

5.1.1 The socio-economic benefits envisaged at appraisal included a minimum of 30% participation of women in project activities, training of women in alternative ways of preparing macadamia nuts, and broadening efforts of diversifying export crops. The promotion of intercropping was also regarded as a means for efficient use of productive resources, food security and enhancement of farm income at family level. From project records, 40% of women farmers trained and currently engaged in macadamia production and marketing. This is well above the 30% envisaged at Appraisal. Macadamia women farmers are already using the macadamia powder for garnishing vegetable dishes and also using the nuts as snacks for the school children. This is expected to have a significant nutritional effect in the region.

5.1.2 As the Macadamia trees have only begun to bear the fruits, farmers are yet to reap the full benefits of the investment. However, farmers' incomes are expected to gradually increase as yields improve, with positive implication on the well-being of the farmers. The project is already contributing to other major elements of poverty reduction in the project area. These include increased access to potable water through the provision of 88 water boreholes, enhanced mobility to markets, basic social and health services through the provision of access roads. In addition, the project benefited the local population during construction as the contractors mainly drew labour, including women from the local communities.

5.2 Environmental impact

The project was classified under category II, which means any adverse impact on the environment could easily be addressed. The Government policy to favour intensified agriculture instead of making more land available for plantation of macadamia played an important role in conserving the environment. Also important is the adoption of agricultural practices such as intercropping with legumes crops, training farmers in integrated pest management, optimal use of pesticides, and contour ploughing. The project also advocated the use of compost manure and rationalized use of inorganic fertilisers. The project activities have as such had no negative impacts on the environment.

6 PROJECT SUSTAINABILITY AND VIABILITY

The project has introduced significant capacity building in all aspects of macadamia production and accomplished satisfactory levels of community involvement and ownership of the activities. The continuation of development of investment gains would depend on the strength of macadamia cooperative societies' in the provision of timely technical and business needs as well as social challenges emanating from the macadamia community. For this to happen, there is need for continued capacity building of cooperatives in areas of post-handling of macadamia crop, obtaining supplies and accessing markets by the ADDs Agribusiness Units. The water point committees are functional and have been capacitated to maintain the boreholes. However, for long-term sustainability, the Government is recommended to continue building capacity of the water committees in the area of how to protect boreholes from vandalism.

7 PERFORMANCE OF THE BANK AND THE BORROWER

7.1 Performance of the Bank

The Bank performance as related to the loan agreement was to undertake field supervisions, ensuring fulfilment of loan conditions and submission of the reports by the borrower. In addition, together with GoM, the Bank was to undertake a MTR. In all, a total of eight supervisions and an MTR were undertaken. The Bank however, did not make a timely follow-up supervision mission after the loan approval that should have minimised the late start-up of project implementation. Furthermore, while most supervision missions lacked appropriate skill mix (e.g. absence of infrastructure specialist), there were also delays in responding to request by the project. Nonetheless, effectiveness delays have been reduced during the course of project implementation by the establishment of the ADB Malawi Office as reflected in shorter periods between loan approval and effectiveness of other Bank financed projects from more than 24 months in the past to 12 months (Malawi Portfolio Performance Report June 2008). Communication between the Bank and the project has also markedly improved. Overall, the performance of the Bank is rated moderately satisfactory.

7.2 Performance of the Borrower

The Borrower was able to implement almost all essential activities needed for achieving the project objective. The Government was less successful in the implementation of infrastructure development activities, with some of the works uncompleted at project closure. Reports, including work-plans and budget, 31 quarterly and 5 audit reports were submitted. However, project financial performance was less satisfactory as audits for 2006/7 and 2007/8 are still outstanding and financial accountability for the 2005/6 audit report was poor. Nonetheless, the Government kept its focus on overall project objectives and provided the necessary institutional set-up for project implementation. Overall, the performance of the Government is rated moderately satisfactory.

8 OVERALL PERFORMANCE AND RATING

In accordance with the implementation performance indicators (Annex 4), the overall assessment of implementation performance is 2.3 out of 4 maximum. The MSDP has been successful in meeting its specific objective of planting macadamia trees on 1,200 ha which was exceeded to 1,320 ha which gives a performance rate of 110%. MSDP's performance is therefore, rated as satisfactory.

9. CONCLUSIONS, LESSONS LEARNED AND RECOMMENDATIONS

9.1 Conclusions

9.1.1 The MSDP has been successful in meeting most of its physical objectives. The project was able to establish macadamia mother and community nurseries which provided high quality seedling to farmers. A total of 132,000 macadamia seedlings, enough to cover 1,320 hectares were distributed. This is against a target of 1,200 hectares. The project was able to meet most of its capacity building objectives as a large number of farmers of which 40% were women (about 3,650 and 130 Ministry staff) have been trained on various aspects of

macadamia production. Although some of the project activities, namely infrastructure development were less successful, there is evidence that the project has been addressing other major elements of poverty reduction in the project area. These include increased access to potable water through the provision of 88 water boreholes, enhanced mobility to basic social and health services through the provision of access roads, and community empowerment through training of farmers and formation of water point committees and cooperatives.

9.1.2 As macadamia trees have only begun to bear the fruits, farmers are yet to reap the full benefits of the investment. Some farmers have, however, started harvesting the crop and selling in local markets. Farmers' incomes are expected to gradually increase as yields improve. This will however depend on the sustainability of the investment in the long term.

9.2 Lessons Learnt

The following are the key lessons to be drawn from this project:

- (i) There is need to carefully consider the duration of a project such as this one involving tree plants whose gestation period is over 5 years. Ideally, a longer period of say 7 years would have been more realistic.
- (ii) There is need for parallel financing as opposed to joint financing of project categories in order to speed up disbursement and project implementation. In this project, a single category was being jointly financed between ADF and GOM. Lack of funds in one account implied that implementation of activities could not proceed according to work-plans.
- (iii) The Bank and Executing Agency supervision missions should be more focused on sustainability issues throughout the implementation period of the project.
- (iv) When the project is to be implemented using existing institutions, there is still need to ensure that the implementation team within the institutions work full-time on project activities. Alternatively, the project should recruit technical experts to strengthen the reimplementation team
- (v) The need to carefully consider mechanisms to deliver credit for smallholder farmers. Where, like in this case, it is determined the project should have a credit component, there is need to carefully assess the capacity of the institutions being targeted.

9.3 Recommendations

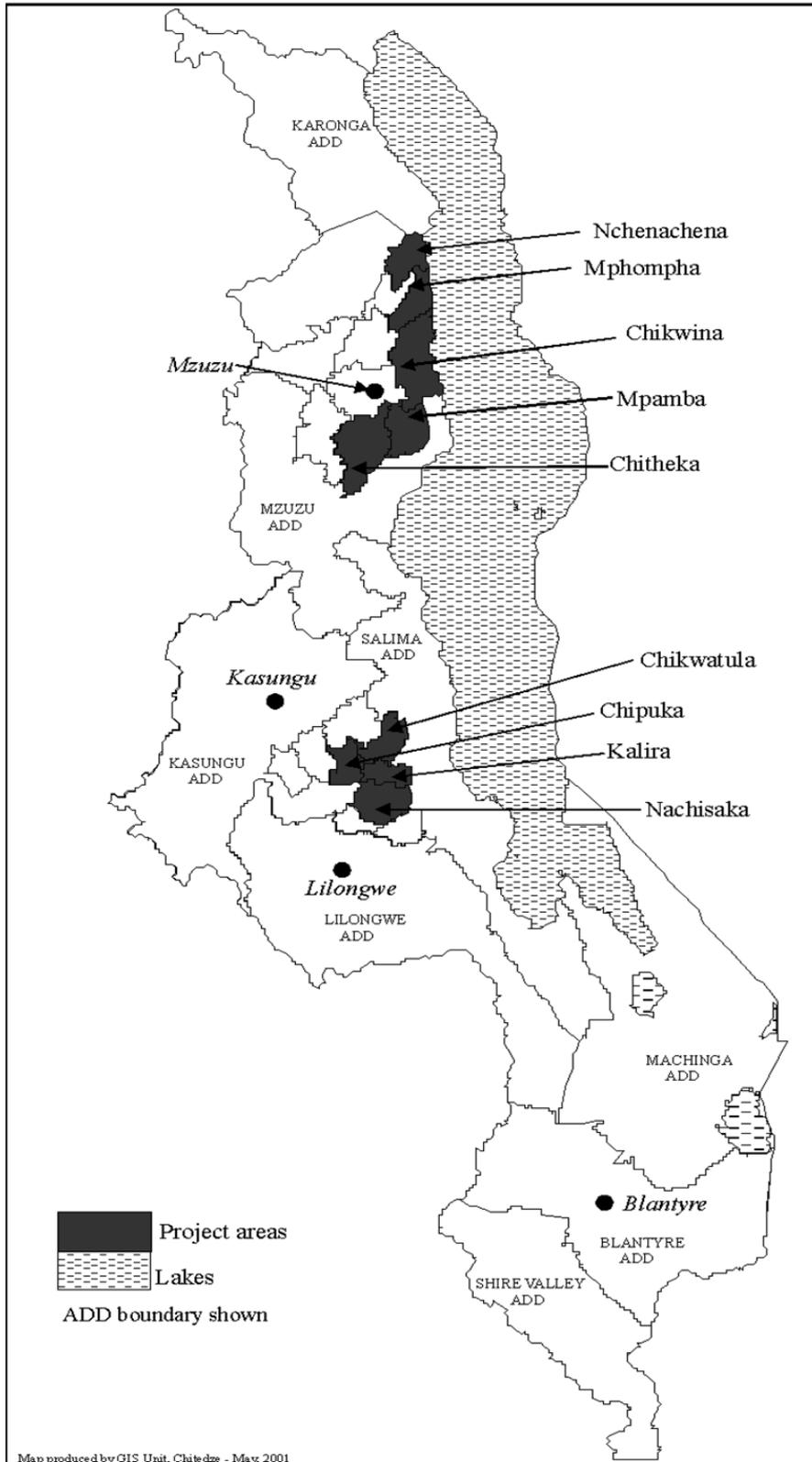
Recommendations to the Bank

- (i) More regular Bank supervision with adequate skill mix is needed. The Malawi Country office is already playing a major role in this regard.
- (ii) The ADB Malawi Field Office should take more proactive role in supervision of projects.
- (iii) Due to the inherent requirement of sequencing activities in fruit tree projects, project duration should be more than five years in order to allow time for implementation of technical activities and capacity building in marketing of the produce.
- (iv) The Bank should consider linking up the activities of establishing apex association and macadamia marketing to the new projects such as Local Economic Development (LED) project which will cover some of the sites under MSDP
- (v) The Bank should search for more effective ways of ensuring that farmers have access to credit

Recommendations to the Borrower

- (i) Government should take over the activities of the project and integrate them in their programming and budgeting in order to avoid a gap in flow of funds for continuation of activities. The decision to include the nursery attendants in the Government's pay roll is an important first step.
- (ii) Given the weak capacity of local consultants and contractors, there is need for more vigorous selection and supervision of consultants and contractors by the Executing Agency. There may be need to review the registration system of contractors in Malawi.
- (iii)** Timely submission of audit reports and justifications for replenishment of funds is critical for smooth flow of funds to project activities.

ANNEX 1. PROJECT LOCATION MAP



ANNEX 2: IMPLEMENTATION PERFORMANCE RATING

FORM IP 1 **Implementation Performance**

Component Indicators	Score (1 to 4)	Remarks
1. Adherence to Time Schedule	1	
2. Adherence to Cost Schedule	3	
3. Compliance with Covenants	2	
4. Adequacy of Monitoring & Evaluation and Reporting	1	
5. Satisfactory Operations (if applicable)	3	
TOTAL	10	
Overall Assessment of Implementation Performance	2.0	Category S (Satisfactory)

ANNEX 3: BANK PERFORMANCE RATING

FORM BP 1 **Bank Performance**

Component Indicators	Score (1 to 4)	Remarks
1. At Identification	2	
2. At Preparation of Project	2	
3. At Appraisal	2	
4. At Supervision	2	
Overall Assessment of Bank Performance	2.0	Category S (Satisfactory)

ANNEX 4: 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	3	
iii)	Fiscal policy	3	
iv)	Finance	3	
v)	Poverty Alleviation, Social and Gender	3	
vi)	Private Sector Development	2	
vii)	Environment	3	
2	Institutional Development		
i)	Institutional Framework including Restructuring	2	
ii)	Financial and Management Information Systems including Audit Systems	1	
iii)	Transfer of Technology	3	
iv)	Staffing by qualified persons including turn over, training of counterpart staff	2	
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	2	
vii)	Economic Viability	3	
viii)	O&M Facilitation (availability of recurrent funding, foreign exchange, spares parts, workshop facilities etc.	1	
4	Economic Internal Rate of Return		
	TOTAL	41	
	OVERALL ASSESSMENT OF OUTCOME	2.3	Category S

ANNEX 5: 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.	The Bank could link up the activities of establishing apex association and macadamia marketing to the new projects such as Local Economic Development (LED) project which will cover some of the sites under MSDP	Government to request Bank for inclusion of Apex establishment & post-handling activities of macadamia in the LED project
Project Implementation	In spite of the initial take-off delays, the overall satisfactory performance can be attributed to the community motivation, empowerment and TA input		
Compliance with Loan Conditions and Covenants	All Bank conditions were complied with (including quarterly reporting and audits). However, submission of audit reports was not satisfactory	Bank Appraisal missions should include mechanisms for prompt fulfilment of loan conditions to avoid start-up delays in implementation of projects	Bank
Performance Evaluation and Project Outcome	Rated satisfactory due to the achievement of project objective and high potential on poverty reduction.	Consolidation of management of cooperatives activities and training needed	Government and Cooperatives
Sustainability		Government resources are needed to continue the delivery of extension on marketing and completion of infrastructure component activities. In addition, more emphasis should be put on marketing and Integrated pest management and involvement of district assemblies and private sector	Central Government and District Assemblies.

ANNEX 6: FINANCIAL AND ECONOMIC ANALYSIS

Introduction: the Economic and financial analysis of the project has been determined through the application of the evaluation method known as the discounted funds flow cost-benefit analysis. The financial analysis is conducted to assess whether the smallholder farmers have benefited from their participation in the project through the cultivation of Macadamia and other inter-crops.

Financial Analysis:

Assumptions: The main assumption at appraisal have been retained with some variations as follows:

- (i) The average export price of Macadamia has been used in the analysis unlike in the appraisal where the adjusted international price international. The inter-cropped prices used are the average 2007market prices
- (ii) The actual area of cultivation has been used and assumed to reach 1320 ha unlike 500 ha in the appraisal report
- (iii) The programme costs and benefits are programmed for 30 years.

The financial analysis assumes that the beneficiary smallholder would have three levels of benefits (i) from the capacity building activities (ii) from on-farm agricultural investments and (iii) from the infrastructural investments in the region. Different crop production models were developed for Macadamia and the other crops: pulses, ground nuts, and cassava, which are the main inter-crops. On the basis of the proposed crop models, average increases on net benefits subsequent to the project interventions were derived by calculating the difference in the net return between a range of present situations and potential situations.

Economic Returns

In the calculation of ERR, the benefits and cost streams from incremental crop production were considered and presented in Annex 6 Table 2. The net benefit accrued from: (i) incremental crop production; (i) the incremental crop production cost; (ii) total MSDP investment costs (civil works, vehicles, equipment); and (iii) operation and maintenance cost (including PIU's operation costs).

For traded inputs and outputs, the World Bank Development Prospects Group, Commodity Price Data report (dated Nov. 2004) were used to estimate their farm-gate economic prices in constant 2007 terms, and for non-traded inputs and outputs, their financial prices were based on prevailing market prices in Malawi in 2007. All economic values were converted to local currency at the official exchange rate prevailing it 2005 end year, which was one US dollar equal to MK110. The shadow wage rate was assumed to be the same as the financial wage rate. The cost and benefit streams were projected over a 30 year period.

ANNEX 6: MALAWI MACADAMIA SMALLHOLDER DEVELOPMNRT
Table 1: PROJECT

Envisaged Situation with Intercrops per ha of Rainfed Land
at Project Year 3

	Maize (0.389)	Cassava (0.145)	Sweet Potatoes (0.08)	Groundnut (0.026)	Soya Bean (0.048)	Cowpea (0.020)
I. PRODUCTION						
Average Production/ha	1760	7500	6000	640	1080	350
Price (MK/kg)	20	7	5	45	25	30
Gross Income (MK)	35200	52500	30000	28800	27000	10500
II. INPUTS COSTS						
Seed	300	62	185	2500	270	60
Fertilizer	800	0	0	0	0	0
Manure	0	0	0	0	0	0
Pesticides	0	0	0	0	0	0
Bags	75	150	225	30	45	0
Hired Labour	0	0	0	0	0	0
Credit Repayment	176.25	31.8	61.5	379.5	47.25	9
Total Costs (MK)	1351.25	243.8	471.5	2909.5	362.25	69
III. NET BENEFITS						
Total Persons/day	165	150	160	200	75	60
Return/Person day	205.1439	348.3747	184.5531	129.4525	355.17	173.85

ANNEX 6:TABLE:2- MACADAMIA SMALLHOLDER DEVELOPMENT PROJECT -INTERNAL RATE OF RETURN

RETURNS	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Incremental Maize Production (Tonnes)	265	265	265	220	210	180	170	170	170	170
Price MK/Tonne	20	20	20	20	20	20	20	20	20	20
Incremental Benefits	5300	5300	5300	4400	4200	3600	3400	3400	3400	3400
Incremental Pulses production	12.4	12.1	10.7	10.2	10.2	10.2	11	11	11	11
Price MK/Tonne	26	26	26	26	26	26	26	26	26	26
Incremental Benefits	322.4	314.6	278.2	265.2	265.2	265.2	286	286	286	286
Incremental Cassava Production	26	24	24	24	20	20	14	14	14	14
Price MK/Tonne	8	8	8	8	8	8	8	8	8	8
Incremental Benefits	208	192	192	192	160	160	112	112	112	112
Incremental G/Nuts Production	7.4	3.4	3.4	3	3	3.1	3.1	3	3	3
Price MK/Tonne	250	250	250	250	250	250	250	250	250	250
Incremental Benefits	1850	850	850	750	750	775	775	750	750	750
Incremental Macadamia Production	-	-	-	-	-	-	750	750	1000	1000
Price MK/Tonne	-	-	-	-	-	-	280	280	280	280
Incremental Benefits							210000	210000	280000	280000
TOTAL BENEFITS	7680.4	6656.6	6620.2	5607.2	5375.2	4800.2	214573	214548	284548	284548
COST										
Investment Costs	33459	40153	45000	56000	46000	177800	215000	65000		
Replacement cost										
Operating costs	20	15	13.7	14.1	8.5	6.2	6.2	2	2	2
Total Costs	33479	40168	45013.7	56014.1	46008.5	177806.2	215006.2	65002	2	2
<u>Cash Flow</u>	-25798.6	-33511.4	-38393.5	-50406.9	-40633.3	-173006	-433.2	149546	284546	284546

ERR 15.4%

Sensitivity Analysis

- (i) Decline in 20% production 13.4
- (ii) Decline in Macadamia price by 20% 14.5