



EXTENSION PROJECT: *PHASE III*

ANNUAL REPORT

OCTOBER 2000 TO SEPTEMBER 2001

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NATURE PROGRAM

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TABLE OF CONTENTS

ADMINISTRATION AND COORDINATION	1
TECHNOLOGY DEVELOPMENT	3
PRODUCTION OF EXTENSION AND TRAINING MATERIALS	3
Training Kit	4
Landcare Practices in Malawi.....	4
Agroforestry and Soil Conservation Booklets	4
Chichewa Posters, Leaflets and Radio Messages	5
PARTNER SUPPORT SERVICES AND MAFE'S NEW RESOURCE	
CENTER	5
Resource Center	5
Training Support.....	6
Distribution of Extension and Training Materials, and Other Inputs.....	7
Germplasm.....	7
FARMER ADOPTION OF AGROFORESTRY/SOIL CONSERVATION	
PRACTICES	8
Adoption Results for 2000/01 and Targets for 2001/02	8
AN EVALUATION OF EXTENSION SERVICES AND NEEDS	9
Inter-Project Collaboration between PROSCARP and MAFE.....	9
Coordination and Policy Support	11
Extension and Training Services	11
MARKETING AND ENTERPRISE PROGRAM	12
Inception Phase, October - December 2001	12
Phase II: Market Identification And Product Sampling, January - September 2001 ...	15

MALAWI AGROFORESTRY EXTENSION PROJECT:

ANNUAL REPORT: OCTOBER 1, 2000 TO SEPTEMBER 30, 2001

ADMINISTRATION AND COORDINATION

Financial and Technical Reports/Publications:

- October-September Financial reports to WSU for onward processing to USAID.
- Results of undersowing *Tephrosia vogelii* for use as an improved fallow: Reduced tillage/agroforestry/legume demonstration trials 1996/97 to 1998/99. MAFE mimeographed report, October 2000.
- MAFEP Quarterly Reports for October-December 2000, January-March 2001, April-June 2001 and July-September 2001.
- Ecological interactions in agroforestry systems. HSK Phombeya. Presented at the ICRAF Regional Training of Trainers Course, Bunda College of Agriculture, November 17, 2000.
- Malawi Agroforestry Extension Project: Case Study I: Agroforestry Development. WT Bunderson, IM Hayes, ZD Jere and HSK Phombeya. Presented at the ICRAF Regional Training of Trainers Course, Bunda College of Agriculture, November 28, 2000.
- Malawi Agroforestry Extension Project: Strategies to Increase the Adoption of Agroforestry and Soil Conservation Practices by Farmers in Malawi W.T. Bunderson, I.M. Hayes Z.D. Jere and HSK Phombeya. Paper submitted to LRCD. February 14, 2001. Lilongwe.
- Malawi Agroforestry Extension Project: R4 Report and Narrative for 2000. Submitted to USAID Malawi. February, 2001.
- Best-Bet Agroforestry and Soil Conservation Practices (Chichewa version): Booklet Series No. 2. Z.D. Jere, W.T. Bunderson, I.M. Hayes, O.A. Itimu and D. Hardesty. MAFE Publication No. 35. Lilongwe.
- Summary of MAFE trials of undersowing and improved fallows with *Tephrosia vogelii*, *Sesbania sesban* and *Crotalaria grahaminiana*. W.T. Bunderson, Z.D. Jere, H.S.K. Phombeya I.M. Hayes, and P. Thangata. August 2001.
- MAFE Project: Achievements to date and recommendations to scale-up adoption. Annual Conference of the Land Resources Conservation Department, Prepared by WT Bunderson, ZD Jere, IM Hayes, HSK Phombeya and JH Pratt. August 2001, Mangochi.
- MAFE Project: Phase III: Annual Workplan October 2001 to July 2002. MAFE Publication No. 39, October 2001.

Key Partner Conferences and Meetings

- MAFE participated in the Annual Conference of the Land Resources Conservation Department at the end of June. A paper was presented which is listed above. Relevant minutes of the conference are included in Appendix 5 of this report.

- MAFE's Annual Partner Review Meeting was held from July 31-August 2 to evaluate 2000/01 results and to set targets for 2001/02. Minutes of the meeting were produced and distributed to all participants and to USAID. They are also included in **Appendix 6** of this report.
- A review was prepared on the nature of support to NASFAM and lessons learned with recommendations for continuation of land-use management programs directly under NASFAM.

Changes in MAFE Staff

Two senior positions were proposed, advertized and filled during the quarter.

- Mr John H. Pratt joined the project October 15, 2000 as the Marketing Specialist to evaluate opportunities to increase adoption levels of certain practices as well as incomes based on high potential NR products related to the practices and species promoted by MAFE. Details of his work program and objectives are described below in a separate section on this topic.
- Dr Henry S. K. Phombeya joined the project November 1, 2000 as Coordinator of MAFE's Resource Center to improve and streamline support services to project partners. Details of his work program and objectives are described below in a separate section on this topic.

Equipment / Supplies Received:

- Binding machine and miscellaneous stationary
- printer inkjet and toner cartridges
- 3000 line levels
- 2 desk and 2 laptop computers systems with 2 printers and 2 UPSs
- 2 Toyota Landcruiser 4x4 pickups
- 2 Toyota Landcruiser 4x4 6 seater hardtops
- Digital video camera with hard case and tripod
- LCD projector with hard case
- 2 Portable overhead projectors
- 1 slide projector
- 2 portable projector screens
- 1 fax machine
- 1 large size laminator
- 3 easels
- 2 heavy duty loppers for tree pruning
- 100 tally counters 100 solar calculators for use in M&E activities
- 2 x 100 m measuring tapes
- 2 x 50 kg capacity platform scales for weighing seed
- 2 x 2 kg capacity portable balance scales and 2 x 10 kg spring hanging scales
- 3100 Chichewa Booklets on Best-bet AF/SC practices
- Galvanized shelving for the storage of tree seed and nursery supplies in the Resource Center
- 320 x 90 litre bins and 100 x 45 litre bins for storage of tree seed in the Resource Center
- Furniture for the Resource Center Offices and Training Room

TECHNOLOGY DEVELOPMENT

Important results of recent research on existing practices include the following:

- Evaluation of raised platforms made from local wood frames and reed mats vs. expanded metal sheets in growing healthy “air-pruned” *Faidherbia albida* seedlings. Platforms constructed with local materials proved satisfactory and greatly reduced costs.
- Increased planting density of *F. albida* seedlings from 100 to 200 seedlings/ha to ensure a higher survival rate of healthy seedlings for a faster effect on soil fertility/crop yields.
- Improved propagation of red mahogany (*Khaya nyasica*), a species slow and difficult to raise in the nursery. Results of studies showed better germination and healthier seedlings by using a more sandy potting medium, larger pots, and 5 seeds per pot at the time of sowing.
- Seed treatment tests were performed on the major tree species recommended by MAFE to compare new and old methods of tree seed treatments. The results are reflected in the new extension materials developed and in preparation.
- Results of undersowing and improved fallow trials conducted over previous years with *Tephrosia vogelii*, *Sesbania sesban* and *Crotalaria grahaminiana* were presented in 2 research papers (listed under MAFE publications above). *Tephrosia* showed the best results with undersowing. The *Crotalaria* species was recommended by researchers at Chitedze, but our results over 3 years have demonstrated inferior performance from competitive interactions with maize, low biomass yields and severe defoliation by a species of caterpillar at all sites. *Sesbania* gave the best maize yields as an improved fallow but the costs of establishment from seedlings make it impractical for farmers. *Tephrosia* also gave good results and was easy to establish from direct sowing as an intercrop with maize in the first season. *Crotalaria* had to be established as a sole crop in the first season to provide adequate biomass for a maize response after the fallow.
- Undersowing *Tephrosia vogelii* was evaluated under high densities of maize, i.e., spacing of 75 cm x 25 cm, which quickly revealed that undersowing was not feasible due to competitive effects on the growth of *Tephrosia*. A maize stand of this density clearly requires chemical fertilizers and organic manures to ensure maintenance or improvements in yields.

Research and development activities on the production and marketing of non-timber products, notably from *Moringa oleifera* and *Jatropha curcas*, as well as others are fully reported under the section on **Marketing and Enterprise Program**.

PRODUCTION OF EXTENSION AND TRAINING MATERIALS

MAFEP is making intensive revisions to update and expand its extension and training materials for dissemination to partners and policy makers.

These materials reflect the current state of the art in agroforestry and soil conservation based on 15 years of research and extension. They are and will remain an important legacy of the project to serve the interests and needs of implementers, researchers, farmers, policy makers and others, both now and in the future.

Materials completed or in progress include:

Training Kit

A new training kit was produced on agroforestry and soil conservation practices. It contains 90 color transparencies, a CD of which was sent to WSU for printing 100 copies. The kits are expected to arrive next quarter, and will be available for purchase from the Resource Center to partner organizations for training their own staff.

Landcare Practices in Malawi

This is a complete revision of the 1995 *Field Manual of Agroforestry Practices in Malawi*, but re-titled *Landcare Practices in Malawi* to reflect a broader coverage of NRM technologies. Final editing and formatting will be completed for printing and binding at WSU in the first quarter of 2002. A total of 5000 copies are planned for shipment and distribution through the Resource Center. The organization and contents of the manual are as follows:

Acknowledgements

Foreword

The Malawi Agroforestry Extension Project

Chapter 1: Landcare Issues in Malawi

Chapter 2: Developing Community-Based Action Plans

Chapter 3: Tree Propagation and Outplanting

Chapter 4: Soil and Water Conservation

Chapter 5: Tree Planting for Improving Soil Fertility

Chapter 6: Tree Planting for Wood and Other Products

Chapter 7: Common Agroforestry Species in Malawi

Reference Tables on Agroforestry and Soil Conservation Practices

Index of Species

Glossary

Literature Cited

Agroforestry and Soil Conservation Booklets

- The English version of the booklet on best-bet Agroforestry and Soil Conservation Practices in Malawi has been revised to reflect the latest improvements in the practices promoted. Printing will be done at WSU early next year. The booklets will be available through the Resource Center to partner organizations for disbursement to field staff.
- The above booklet has been translated into Chichewa and 3100 copies have been printed and shipped to Malawi. A Yao version is also planned during the workplan period.
- Two booklets are in preparation for printing by WSU during the first quarter of 2002:
 1. Tree Seed Collection, Nursery Management and Outplanting and
 2. Common Agroforestry and Soil Conservation Species in Malawi.

3000 copies will be printed for each of these booklets.

Chichewa Posters, Leaflets and Radio Messages

Chichewa posters are being revised as needed for reprinting. Four new ones are also planned for production during the 2001/02 workplan period. The list of posters is shown below.

Tree Propagation/Outplanting	Soil & Water Conservation	Agroforestry Practices
<ul style="list-style-type: none"> • Tree species and uses • Nursery design and construction • Nursery management • Tree spacing • Tree outplanting 	<ul style="list-style-type: none"> • Contour ridging using a line level • Measures for gully control • Use of vetiver in gully control • Stream bank protection • Soil and water conservation using vetiver grass 	<ul style="list-style-type: none"> • Dispersed systematic interplanting • Undersowing maize with <i>Tephrosia vogelii</i> • Improved fallows with <i>Tephrosia vogelii</i> • Natural regeneration of trees in communal and farm land areas.

Additional extension materials planned for 2001/02 included leaflets in Chichewa and radio messages on the above topics for broadcast at strategic times on the Malawi Broadcast System.

PARTNER SUPPORT SERVICES AND MAFE'S NEW RESOURCE CENTER

Resource Center

MAFE has established a Resource Center to make support services to partners and collaborators as efficient and effective as possible. The Resource Center is located on the ground floor of the Department of Land Resources Conservation, and offers the following facilities:

- Customer and Library Services for technical, germplasm and extension support.
- Training Classroom, fully equipped with audio-visual facilities.
- Seed Banks for cold and refrigerated storage of tree seed.
- Warehouse for storage of nursery supplies and tools.
- Offices for the Resource Center Coordinator and Manager.

The demand for services provided through the Resource Center has risen sharply over the past 2 years with support to over 60 partners. It has also been accompanied by a willingness to pay commercial fees for each service rendered. This demonstrates real market needs and a high degree of confidence in the program.

The nature of support from the Resource Center takes 2 forms:

Partnerships: Main partners include government agencies, NGOs, projects and private companies that have entered into an agreement with MAFEP for support services to increase the adoption rate and impact of improved agroforestry and soil conservation practices.

Services provided include:

- Technical information on what practices to target based on the community and problems to be addressed, location and agro-environment.
- On farm evaluation of new technologies developed by researchers.
- Training courses in subject areas defined by the partner.
- Extension / training materials (e.g., field manuals, booklets, posters, and training kits).
- Germplasm support for planting material best suited to partner needs.
- Follow-up field visits to assess progress, management and problems that need correction.
- Improved M&E methods to document results at low cost with consistency and reliability.

Partners provide workplans on results and targets by number of households, area conserved and number of trees planted.

Informal Support: Requests have proliferated for MAFEP to provide information and assistance on tree planting and soil conservation to individuals, groups, communities, clubs, CBOs and commercial farmers. Since MAFEP has a mandate to expand results on the ground, and is well placed to provide assistance, it is right and proper to help those seeking support. Most assistance is in the form of supplying seed and relevant information with advice on contacts for further assistance in the location targeted.

With the exception of Government agencies, materials and services are provided on a semi-commercial basis to better meet real market demands and to build capacity for sustaining services in the future. During the coming workplan period, full accounting will be made of all users of the Resource Center to document the number, nature and trends of requests so as to evaluate the usefulness and effectiveness of the services provided.

Current prices for these services are shown in **Appendix 1**. Although many are partially subsidized, all partners including Government agencies agreed to pay the full costs for these services after the close of MAFEP. **Appendix 2** gives a full list of partners and collaborators.

Training Support

The objective of the training program is to build capacity among partner organizations by improving knowledge and skills of staff in extending and monitoring best-bet NRM practices.

Training courses conducted to meet partner requests are summarized in **Table 1**.

Table 1: Training Provided for 2000/2001

Organization	Training Conducted 2000/01		
	Trainers/ Management Staff	Frontline Staff	Local Leaders/ Farmers
MAI/ADDs	40	30	0
Donor Funded Projects	103	57	4
Education Institutions	4	0	0
Forestry Department	55	0	0
NGOs	20	65	0
CBOs	21	8	57
Totals	243	160	61

Distribution of Extension and Training Materials, and Other Inputs

Extension materials and other inputs distributed to partners and clients are summarized in Table 2.

Table 2: Extension Materials Distributed in 2000/01

Organization	Extension and Other Materials Distributed in 2000/01					
	Field Manuals	English Booklets	Chichewa Booklets	Posters in Chichewa	Folytubes/Pots	Line Levels
MAI/ADDs	1	106	1	1125	5,443,730	160
Donor Funded Projects	1	164	1	531	1,350,100	43
Education Institutions		39	0	324	0	4
Forestry Department	1	62	120	2259	1,095,000	35
NGOs		37	14	1895	4,489,750	1,259
CBOs		63	0	481	544,800	34
Others	2	0	0	18	16,300	0
Totals	5	471	136	6633	12,939,680	1,535

Germplasm

The distribution of germplasm is shown in Table 3, with a breakdown by species and partner/client in Appendix 3.

Table 3: Distribution of Germplasm in 2000/01

Organization	Type of Germplasm Distributed in 2000/01							
	<i>General Tree Seed</i>		<i>Tephrosia vogelii</i>		<i>Faidherbia albida</i>		Vetiver Grass	
	No. of Partners	Seed (kg)	No. of Partners	Seed (kg)	No. of Partners	Seed (kg)	No. of Partners	*Truck Loads
MAI/ADDs	8	2215	8	3840	8	722	4	68
Donor Funded Projects	10	1683	8	3609	13	203	1	14
Education Institutions	1	5	0	0	1	1		
Forestry Department	7	625	0	0	8	64		
NGOs	16	2676	17	1714	17	408	2	2
CBOs	13	296	5	332	12	24		
Others	2	13	1	2	2	1		
Totals	57	7,513	39	9,497	61	1,423	7	84

* Refers to 7 ton truck loads provided directly by MAFE

Collection of tree seed and purchasing of nursery inputs was initiated to meet partner targets for planting 15-20 million trees for the 2001/02 season. Details are shown in the Annual Workplan for October 2001-July 2002 (see MAFE Pub. Series No. 39).

FARMER ADOPTION OF AGROFORESTRY/SOIL CONSERVATION PRACTICES

Adoption Results for 2000/01 and Targets for 2001/02

Data from partners on technology adoption results by farmers have been collected and entered into MAFE's spreadsheet database. The results are summarized in **Table 4** with details in **Appendix 4 Tables 1a, b and c**. Despite substantial increases in adoption of many practices, important impediments remain. Key extension service factors that contribute to this problem and that affect many government agencies and NGOs include:

- » continued use of top-down extension methods;
- » low levels of expertise, skills and motivation among extension staff;
- » poor institutional and resource support at the field level;
- » limited production and use of up-to-date extension materials;
- » inadequate targeting and planning to match technologies and services to farmer priorities;
- » insufficient supplies of germplasm and modalities for multiplication;
- » lack of coordination and consistency in the extension of technical messages among service providers including ADDs, the Forestry Department, donor-funded projects and NGOs;
- » use of conflicting and inappropriate incentives to encourage adoption;
- » absence of a systematic approach to tackle the challenge of reaching farmers countrywide;
- » inadequate monitoring and evaluation to document what is working where and why, so that plans can build on strengths and address weaknesses.

Table 4: Adoption Rates of Key Practices for 2001 and Targets for 2002 *

TECHNOLOGY/PRACTICE	TARGETS	RESULTS 2001		TARGETS
	2001	2001	Cumulative	2002
Vetiver Grass				
Contour Hedges (ha)	5,625	4,941	14,316	5,684
No. Farm Families	17,699	20,008	52,309	18,000
Undersowing <i>Tephrosia</i>				
Seed distributed (tons)	10.0	9.5	NA	10.0
Area (ha)	5,000	2,765	5,841	8,000
No. Farm Families	14,635	26,635	57,000	23,000
Soil Improving Trees				
Seed distributed (tons)	1.5	1.4	NA	2.0
Area (ha)	5,880	11,148	28,268	11,732
No. Farm Families	14,635	39,488	96,236	43,764
Trees for Wood/Other Uses				
Seed distributed (tons)	7.0	7.5	NA	10.0
No. Trees (millions)	9.8	9.3	NA	10.0
No. Farm Families	30,838	59,311	210,865	39,135

* Disbursements of seed and tree planting for wood/other uses are annual quantities. Targets reflect achievements expected for that year. Results include annual and cumulative levels since 1996.

AN EVALUATION OF EXTENSION APPROACHES AND NEEDS

MAFEP has been instrumental in evaluating the effectiveness of extension services by Government agencies and NGOs as reflected in the adoption levels of new practices.

Lessons learnt are well documented and recommendations have been made to improve and streamline the organization and management of these services.

Inter-Project Collaboration between PROSCARP and MAFE

The inter-project coordination between Promotion of Soil Conservation and Rural Production (PROSCARP) funded by the EU and the Malawi Agroforestry Extension Project (MAFE) was initiated in two impact areas of Malingunde, Lilongwe West and Chiwamba, Lilongwe East both under Lilongwe ADD to achieve the following objectives:

1. Test approaches to improve adoption of AF/SC and to make extension more efficient and cost effective through provision of direct support to field level activities
2. Identify major factors that contribute towards the success of AF/SC program at field level
3. Share resources and responsibilities according to the comparative advantage of each project.

Activities to achieve the above objectives:

- Identify the focus areas within the impact areas
- Facilitate development of action plans using village level participatory approaches
- Provide administrative, financial and logistical field support and supervision
- Assign 1 technician at each site to provide field supervision. The technicians were required to visit the areas twice weekly on fixed days to ensure continuity of technical support
- Provide improved crop seed at cost price to the communities in the target areas
- Provide AF/SC extension materials, line levels, tree seed and polytubes to the communities in the target areas
- Train frontline staff and farmers in nursery management and agroforestry practices
- Conduct CBM&E in the target areas
- Make joint fortnightly site visits.

Table 5: 2000/2001 Adoption Results

TECHNOLOGY/PRACTICE	MALINGUNDE		CHIWAMBA	
	Target	Result	Target	Result
Vetiver Grass				
Contour Hedges (ha)	237	34.7	21	17
No. Farm Families	319	258	432	164
Contour ridge realignment				
Area (ha)	237	2.4	19	10
No. Farm Families	319	20	432	164
Undersowing <i>Tephrosia</i>				
Area (ha)	10	24	76.6	52.5
No. Farm Families	319	126	405	124
Dispersed Systematic				
No. Trees	3,800	9,252	19,720	10,102
No. Farm Families	319	259	452	186
Homestead/Boundary Planting				
No. Trees	32,387	25,230	99,330	18,664
No. Farm Families	319	259	579	209

Lessons learnt and recommendations to improve program implementation

- Regular follow-up visits are critical to the success of field-based programs. FAs appreciated the technical support provided by MAFE's field technicians who visited each site twice weekly. It was apparent that this type of support motivated the frontline staff within the focus sites more than their colleagues in those sites where direct supervision was not being provided.
- As the results show, discrepancies between targets and results remain relatively high both in terms of area covered and number of farm families participating in almost all the technologies. In this regard, there is need to train both staff and farmers how best to target practices more realistically with communities using guidelines developed by MAFE.
- Availability of vetiver remains a major obstacle. Little effort is being made to set up nurseries. Materials tend to be collected far from the target sites, which is both costly and non-sustainable.
- Community assessments show that farmers appreciate the benefits of nurseries, vetiver hedgerows and all forms of tree planting but found ridge realignment labour intensive and time consuming.
- There is much duplication and little coordination among NGOs/Projects working in the same areas. In Chiwamba EPA alone, there are over 10 organizations, all involved in one way or another in promoting AF/SC practices. This is compounded by the fact that some NGOs use inappropriate incentives to attract farmers to their programs. The Development Officer made attempts to coordinate these NGOs but success depends on the desire of all parties concerned to work together and for top management to show flexibility to coordinate activities and to harmonize approaches.
- Inter-project collaboration between PROSCARP and MAFE demonstrated that with good intentions, resources, responsibilities and information can be shared effectively between parties implementing programs that address common problems or needs in the same areas with the same communities. This paradigm may apply not only to projects but also to government/non-governmental, community-based and private sector organizations.

Coordination and Policy Support

The National Agroforestry Steering Committee and Agricultural Technology Clearing Committee with support from LRCD should take a stronger leadership role in the following tasks:

- guide and coordinate NRM research and development among service providers,
- resolve conflicts over approved and recommended technologies, and ensure consistency and technical accuracy in their extension delivery,
- discourage the use of inappropriate incentives to aid adoption, and set specific guides on what forms of assistance are appropriate,
- increase the profile of natural resource management within the MAI as a national priority by demonstrating the integral link between improvements in the natural resource base and sustained agricultural productivity,
- promote institutional cooperation and partnerships to leverage resources for broader and faster results with agreement on desired outcomes and strategies to achieve them.

Extension and Training Services

An important step in scaling up the adoption of agroforestry and conservation practices is to mandate every EPA and District Forestry Office to target at least one manageable area/community for quality results. Projects, NGOs and others working in agriculture and NRM could follow the same recommendations in each of their target sites/villages. To ensure success, it is the management of these organizations/projects must be accountable for providing the resources and support needed for all field staff to carry out effective extension activities.

Guidelines of operation include the following:

- Organize program management and supervision with clearly defined staff responsibilities and accountability for results.
- Build capacity and expertise through quality staff training and provision of accurate, up-to-date extension materials to effectively transfer skills and knowledge to farmers.
- Ensure community participation at all stages, from problem identification to implementation and evaluation.
- Assist the community in effective leadership by transferring responsibility to traditional authorities to resolve conflicts and to encourage community spirit and commitment.
- Increase the supply of germplasm with a focus on community self-sufficiency to meet increasing national demands on a sustainable basis.
- Concentrate resources at the field level for more effective extension support to generate early successes, taking into account the following recommendations:
 - Set targets that are feasible and sustainable within the area, time and resources available. This will attract greater investment and partner commitment so that results can be scaled up as capacity and confidence increase.
 - Emphasize establishment of agreed practices on a communal basis for more timely and effective establishment with broader impacts.

- Focus on proven technologies and species that address identified farmer needs and interests, recognizing that farmers will not undertake NRM practices simply for the sake of conservation - there must be tangible returns with direct benefits to their lives (incomes, yields, products, better labor efficiency).
- Provide planting materials and nursery inputs in quantities that match the targets set for timely nursery sowing and field outplanting.
- Improve the efficiency, reliability and cost of monitoring through community-based systems to track achievements and to identify needed changes for better and faster results.
- Ensure program continuity to achieve targeted results since changes in direction are disruptive and can destroy partnerships and relationships with communities.

MARKETING AND ENTERPRISE PROGRAM

The aims of the Marketing and Enterprise Program (MEP) are as follows:

Goal

Enhance rural livelihoods through production and marketing of natural resource based (NR) products from plants that contribute to the sustainable use and management of farm resources.

Purpose

Identify potential production and marketing opportunities of existing and new NR products for income generation (among farmers and others) and to enhance adoption of natural resources management (NRM) practices.

Principal Objectives

Investigate, research, pilot, select and promote the production and marketing of NR products having high commercial potential in Malawi.

The 2000 - 01 Annual Workplan stipulated a primary focus of the program on potential products from species currently promoted by MAFE. This criterion has dominated the initial process of product identification and selection.

Inception Phase, October - December 2001

USAID-sponsored networks

During 2000, before the arrival of the Marketing Specialist, MAFE staff attended a meeting of the Agribusiness in Sustainable Natural African Plant Products Roundtable (A-SNAPP) in Cape Town. MAFE subsequently applied for membership of this USAID supported organization to share experiences, information and possible collaboration in NR product market research.

Personnel

The Marketing Specialist, John Pratt, took up his duties in October. MAFE colleagues provided background information about MAFE, the distribution of agroforestry species, collaborating partners and ideas for future commercial R & D and possible partnerships. He began review of available literature on potential commercialization of agroforestry species included in the MAFE Extension Program. Useful publications sourced from colleagues collections and the Resource Center library, included valuable monographs on *Tephrosia vogelii*, *Jatropha curcas* and *Moringa oleifera*.

Internet searching has been conducted and useful professional contacts have been made worldwide through subject searches and accessing institutional and commercial websites.

Information Sources and Potential Collaborators

The Specialist consulted some 50 organizations as follows for advice and to identify areas of complementary interest in NR product development:

Forestry Research Institute of Malawi (FRIM)
National Herbarium and Botanical Gardens (NHBG);
Malawi Chamber of Commerce and Industry (MCCI);
Enterprise Development and Training Agency (EDETA);
Malawi Bureau of Standards (MBS);
Malawi Export Promotion Council (MEPC);
Malawi Industrial Research and Technology Development Centre (MIRTDC);
Community Partnership for Sustainable Resource Management (COMPASS, USAID NATURE Program);
Training for Enterprise in Exports in Malawi (TEEM) Project; and Business Consult Africa Ltd (Busconsult)
Shire Highlands Organic Growers Association (SHOGA) and private estate farmers;
Tea Association of Malawi (TAM);
Cheetah Industries Ltd (Cheetah);
Harmony Foods, Harare
ZOPP (Pvt) Ltd, Harare
Freshtainer (Pvt) Ltd, Harare
FAKT Consult, Germany
Promotion of Soil Conservation and Rural Production Project (PROSCARP);
Wildlife Society of Malawi (WSM);
GTZ Integrated Food Security (GTZIFSP) Promotion of Horticulture (GTZPH) and Plant Protection (GTZPPP) Projects;
Nyika-Vwaza Border Zone Project (BZDP);
Department of Agricultural Research and Technical Services (DARTS): Chitedze Agricultural Research Station Farm Mechanisation Unit (CARS-FMU);
Plan International (PI);
University of Malawi: Chancellor College Chemistry (CCCD) and Physics Departments,
Blantyre Polytechnic (BP) and Bunda College of Agriculture (BCA);
Blantyre Water Board;
Southern Region Water Board;
National Smallholders Farmers Association of Malawi (NASFAM);
Southern Africa Development Community - International Centre for Research in Agroforestry at Makoka (SADC-ICRAF);
SADC Forest Sector Technical Coordination Unit (SADC-FSTCU);
International Eye Foundation (IEF) and IEF-assisted smallscale plant oil producers;
World Bank Project for Community based NRM in Southern Malawi National Parks.
soap manufacturers and paint manufacturers,
process plant manufacturers (including Tanzania & Zimbabwe), vegetable oil and presscake producers/refiners;
NRM and process engineering consultants (Including Germany and UK)
Department for International Development (DFID), Lilongwe: National Forestry Programme
Agribusiness in Sustainable Natural African Plant Products (A-SNAPP), Stellenbosch;
Centre for Scientific and Industrial Research (CSIR), Pretoria;

Leatherhead Food Research Association (LFRA), UK;
Southern Africa Natural Products Trade Association (SANProTA) and Southern Alliance for Indigenous Resources (SAFIRE), Harare
Binga Trees Project, Kariba (BTP)
CRIAA Southern Africa - Development and Consulting (CRIAA SA-DC), Windhoek Veld Products Research and Development of Botswana (VPRDB)
Optima of Africa Ltd, Dar Es Salaam (Optima);
Evangelical Lutheran Church in Tanzania VYAHUMU Oil Seed Project (VYAHUMU)
Church World Service, Senegal (CWS-S);
BIOMASA Project, Nicaragua;
Leicester University (LU), UK;
GTZ GATE information service;
Washington State University International Programs (WSUIP) staff and its library and internet services.

Product/species selection criteria:

After examining research in NR product development by various organizations, MAFE took up the advice of University of Malawi and other partners to the resuscitation of, and further develop former research on oilseed tree species meeting *provisional* product/species selection criteria. The provisional criteria included:

- Potential for short-term development;
- Abundance of raw material to allow immediate production trials and testing of product samples
- Probable suitability for small-scale production and marketing; and
- Environmental impact benign or positive.

The seeds of the oilseed tree species have potential for production of oils for food, cosmetic and industrial purposes and offer interesting by-products, including products with water purification applications.

The Moringa Tree (*Moringa oleifera*) and Jatropha Tree (*Jatropha curcas*), both naturalized species grown around rural households, are prime targets for investigation by MAFE and its partners. The former had already been promoted in Malawi for food security/vitamin nutrition purposes. Moreover, the University of Malawi Chancellor College Chemistry Department (CCCD) and other research organizations had demonstrated that it yielded a seed oil suitable for culinary use. Jatropha yields a non-edible oil which makes an excellent smokeless lamp oil and has potential as an insecticide, for instance in the control of cotton bollworm; methanol extracts of Jatropha seed (which contains biodegradable toxins) have been tested in Germany for control of bilharzia-carrying water snails. Transesterified Jatropha oil can be used as an effective but expensive diesel motor fuel.

Pioneer research undertaken at Thyolo in the early 1990s by Blantyre Polytechnic and Leicester University (UK) proved Moringa powdered seed (and expressed seedcake) was a highly effective drinking water flocculent. MAFE and CCCD agreed to follow this work up. The company Optima of Africa Ltd in Tanzania is undertaking a major investment with outgrowers to develop 12,000 hectares of Moringa plantations for oil production (food, skincare and cosmetic applications) and commercial development of a proprietary polyelectrolyte extract "Phytofloc" for water treatment. While much of the Optima development concerns intellectual property and is commercially sensitive, this industrial development needs to be tracked.

MAFE has already benefited from informal advice received through contact with the Optima Product Development Manager, who formerly worked in Malawi and Blantyre Polytechnic. During June, CCCD convened a meeting of the Blantyre and Southern Region Water Boards, MAFE and the National Research Council to investigate possible substitution of proprietary water treatment products (polyelectrolytes and alum) by Moringa extracts. These would follow up earlier work of Blantyre Polytechnic.

Natal Mahogany (*Trichilia emetica*) is being investigated for its seed oil properties and yield, and uses of bark extracts. Taking up the interest of the Southern Africa Natural Products Trade Association (SANProTA), Wildlife Society of Malawi and Nyika-Vwaza Border Zone Project, investigation of the scope for manufacture and marketing of Marula (*Sclerocarila birrea*) and Manketti (*Schiziohyton rautanenii*) seed oils has been initiated. Manketti is a target species of SANProTA. Marula is already receiving significant R & D attention from various organizations in four Southern African countries and MAFEP plans to collaborate with them. African Star-Chestnut (*Sterculia africana*), also an indigenous species, may also be investigated.

Fish Bean (Tephrosia vogelii)

MAFE is committed to investigation of properties and potential uses of fish bean (*Tephrosia vogelii*). This is planned with assistance from CCCD and the Chemistry Department at the University of Botswana, with which WSU is associated.

Phase II: Market Identification And Product Sampling, January - September 2001

Consensus of Stakeholders

The Director of Land Resources Conservation convened a one-day review of the first 10 months of the Program at Malawi Bureau of Standards on July 25. Stakeholders agreed on strengths, weaknesses, opportunities, and threats that had been revealed by research and agreed to carry out market research with A-SNAPP along with further adaptive and pure research. Papers and proceedings of the stakeholders' meeting were distributed in August.

The next stakeholders general meeting is planned for January, 2002

A-SNAPP collaboration in market investigations

Collaboration in market investigations is planned with A-SNAPP and Rutgers University based on lessons learned from an inconclusive A-SNAPP study in West Africa. It was felt that MAFE and WSU could help conduct a better study in Southern Africa. The plan is to organize a market survey in up to 5 countries for a shortlist of strategic species. Specialists in market analysis and production within the Region would be contracted by MAFE for this purpose. MAFE and WSU have proceeded with developing standardized formats for reporting and respective analysis of production, processing and marketing for review by A-SNAPP.

In addition, MAFE plans to initiate independent surveys in Malawi in November with EDETA, SANProTA, and SAFIRE. Malawi investigations are expected to continue until December. These will include MAFE attendance at an international Moringa Products Workshop in Dar Es Salaam in November.

Product/species selection criteria:

Advice from institutions, projects, the private sector and international sources enabled MAFEP to begin screening recommendations against various criteria. These were established in consultation with A-SNAPP and USAID.

All products should:

1. Have sizeable potential national and regional markets;
2. Be of interest to two or more regional countries, where cross-border trade will be analyzed, and possibly have international market potential;
3. Have significant local subsistence or commercial use (so they will still be of interest to producers if market conditions are temporarily poor);
4. Allow production and processing operations that are technically and economically feasible on a small or medium scale (i.e. determined as requiring capital investment of \$30,000 or less);
5. Be widely grown or abundant, at least locally, allowing rapid production response to market promotion but without depletion of the species.

Special favor will be shown to plants that:

6. Offer benefits in addition to commercial development, such as food security, soil fertility or conservation, or wood supply.
7. Offer production and processing opportunities/synergies that have the potential to increase value added within existing farming systems.

Trade contact and international certification

A small group of international buyers from A-SNAPP's database was approached for expressions of interest in the oils and by-products that would become available for assessment. A full product promotion campaign will be initiated after:

- a) completing market investigations;
- b) receiving international assessment of samples;
- c) determination of their properties; and
- d) calculation of the economics of production based on semi-commercial trials.

Economics of small-scale oilseed processing

A comprehensive literature search indicated that secondary data on *input-output economics* of village-scale extraction of seed oils of *Moringa oleifera*, *Jatropha curcas* and respective qualitative data for the output were not available in any local archive. As this information is vital to developing NRM-based enterprises, it was agreed with the Department of Land Resources Conservation to monitor the economics of oil production and respective output assay for these and competing oils.

MAFE-sponsored oil extraction trials

Monitoring production trials using ram press and aqueous extraction methods was organized commencing February 21 and ending on March 30, 2001. The commercial partner in the trials was a small-scale producer, Khumbo Oil Refinery (Khumbo) and the institutional partners were EDETA (NGO) and Malawi Industrial Research and Technology Development Center (MIRTDC). EDETA's principal task was to monitor physical inputs and outputs while MIRTDC would appraise physical performance of the various processes including operating temperatures. All activities took

place at the premises of Khumbo. A demonstration of extraction was coordinated with the Nyika-Vwaza Border Zone Development project in Bolero, Mzimba North for Manketti in late April.

Technical review

On March 21, MAFE held a brainstorming meeting with EDETA at Khumbo to determine the major physical findings from the trials and needed follow-ups. Meanwhile economic analysis and documentation of the trials were in progress and the chemists carried out qualitative and quantitative tests with additional research on refining the raw products.

Key matters discussed included:

- Logistics, availability and pricing of purchased seeds
- Socio-economics and indicative feasibility of village-based dehusking and winnowing prior to evacuation to 'mill'
- Varietal/provenance factors influencing output
- Drying & storage requirements; problems encountered
- Seed pre-treatment lessons
- Ram press performance and scope for technical improvement
- Aqueous extraction performance
- Hand-squeezing performance
- Scope for mechanized extraction
- Energetic efficiency (charcoal consumed vs oil produced); scope to improve or use bottled gas
- Taste/aromatic assessment for taints/'off' odors in unrefined and refined fractions

Chemistry

- Malawi Bureau of Standards (MBS) and CCCD have conducted comprehensive analysis of production samples, which will be retained for international certification.
- CCCD provided a Research Assistant to assist production monitoring and verify the manner of preparation of samples.
- MBS produced reports on biochemical analysis of all samples and a briefing paper on July 25.
- A report on similar analysis and recommendations is expected from Chancellor College Chemistry Department.
- Due to certain limitations in the laboratories of both institutions, MAFE has taken up membership of Leatherhead Food Research Association for additional analytical services.

A summary of the analyses to date is shown in Table 6.

Engineering

- Following the March 21 meeting, Bunda College of Agriculture (BCA) entered into agreements with MAFE to carry out adaptive research/design improvements of a ram press and a spindle press for tree seeds, notably *Moringa oleifera*.
- A short trial with a Tinytech mechanical expeller was carried out by MAFE, BCA and EDETA in partnership with MIRTDC and Valmore Paints Ltd but the machine performed poorly.

- BCA agreed to carry out joint research/design improvement on a mechanical expeller with a manufacturer in Morogoro, Tanzania. The research in Tanzania involved shipment of 800 kg of phytosanitary-certified MAFE seeds and was supported by Optima of Africa Ltd, which also contributed seeds.
- Bunda College of Agriculture (BCA) has submitted three final reports on engineering adaptive research/design as follows:
 - a) Improvement of a ram press and spindle press for tree seed oils extraction;
 - b) Joint research/design improvement on a mechanical expeller with Intermech Engineering Ltd., ELCT/VYAHUMU Oil Seed Project and Optima of Africa Ltd in Morogoro, Tanzania; and
 - c) Trial with a Tinytech mechanical expeller in partnership with Valmore Paints Ltd, EDETA and MIRTDC.

Table 6: Summary of Chemical Analyses Results

Product	Source	Chemical Composition	Implications/Improvements Needed	Institution Involved
Moringa Oil	BCM Associates	Fatty acid profile very similar to macadamia nut and olive oils. Slightly more saturated than avocado and sweet almond oils. Oil is 70 – 80% oleic, hence may be suitable as a cosmetic carrier.	None of the refined oils produced met MBS Edible Oil Standard 51 due principally to high levels of free fatty acids, presence of insoluble impurities and oxidation. This can be overcome by using titrimetric refining methods, improved filtration and use of less heat in the small-scale refining process	MBS & CCCD
Moringa Presscake	BCM Associates	Protein and oil-rich but with high levels of phytates and saponins, and possibly other toxins/anti-nutrients	For livestock feeding, need to find means of integrating the cake safely into feeding rations or, alternatively, using methods of neutralizing or removing these chemicals	MBS & CCCD
Jatropha Presscake	BCM Associates	Contains toxic components. 40% oleic, 36% polyunsaturated.	Jatropha cake is even more toxic and needs special treatment for feeding purposes	MBS & CCD
Tephrosia Leaves	Lilongwe Golf Club	Tephrosin, deguelin and alpha toxicanol identified	Unusual chemical components found in Tephrosia leaves but work not yet completed.	University of Botswana
<i>Trichilia emetica</i> oil	BCM Associates	41% oleic, 37% saturated, 21% polyunsaturated. Relatively high melting (it is a fat in winter temperatures)	CDC isolated a highly toxic cyanide gas principal from Natal Mahogany seeds released by heating. Use should and will not be promoted among rural communities	Centers for Disease Control, Atlanta

Agronomy and Taxonomy

On the advice of the proprietors of Khumbo Oil Refinery, MAFE approached the National Herbarium and FRIM to determine the differences in the naturalized races of *Moringa*. The work would fall within the scope of an ongoing FRIM research project on the genetic variation of important indigenous and naturalized trees.

Depending on the results of market investigations and product assessment, MAFE may engage FRIM to assist in investigating *Moringa* and *Jatropha* oil production costs under estate and household conditions.

Summary of Partnerships

Ongoing partnerships under this Program are as follows:

Khumbo Oil Refinery and Associates (small-scale processors): *seed procurement, seed conditioning, small-scale oil extraction trials/demonstrations in various rural sites and preparation of samples for laboratories; evaluation of extraction technologies; marketing and market assessment.*

Enterprise Development & Training Agency (EDETA): *production and marketing monitoring; evaluation of extraction technologies; environmental impact assessment and, with MAFEP, economic analysis.*

University of Malawi: Chancellor College Chemistry Department (CCCD) *literature review, reporting on previous research, process monitoring, qualitative and quantitative analysis (also, research into natural polyelectrolytes for water purification), suggested commercial uses of products.*

Malawi Bureau of Standards (MBS): *qualitative and quantitative analysis against Standard MBS 51 and other Standards.*

University of Malawi: Bunda College of Agriculture (BCA): *literature review, reporting on previous research, equipment calibration, process monitoring and adaptive industrial research on oil extraction technologies with presses and expellers (Malawi and Tanzania).*

Malawi Industrial Research and Technology Development Center (MIRTDC): *process monitoring and equipment calibration.*

Forestry Research Institute of Malawi (FRIM) – Seed and Tree Improvement Strategy Area: *literature review, survey of production areas; supply of seeds for trials.*

Institutional Sustainability

Some success has been achieved in human resources development and towards establishing sustainable "institutional memory" as follows:

- Economist/business planner/market research officer: EDETA staff
- Institutional coordination/documentation: MAFE Resource Center
- Ethnobotanist/Herbalist: Limited exchanges with National Herbarium personnel
- Food technologist: research graduates of CCCD; MBS personnel
- Process chemist: faculty and research graduates of CCCD Mechanical/Process engineer: faculty and undergraduate of BCA.

Results of research and recommendations; collaborative agreements

A comprehensive report on activities and results is under preparation.

APPENDIX 1

MAFE Resource Center Price List

Effective October 1, 2001



Products/Services	Actual Cost MK	2001/2002 Partner Price MK	% of Total Cost
Tree seed by species (kg)			
<i>Acacia galpinii</i>	210	70	33%
<i>Acacia polycantha</i>	210	70	33%
<i>Acacia seiberiana</i>	210	70	33%
<i>Azelia quanzensis</i>	300	100	33%
<i>Albizia adianthifolia</i>	300	100	33%
<i>Albizia lebbeck</i>	300	100	33%
<i>Albizia zimmermanii</i>	300	100	33%
<i>Bauhinia thonningii</i>	300	100	33%
<i>Erythrina abyssinica</i>	300	100	33%
<i>Faidherbia albida</i>	210	70	33%
<i>Khaya nyasica</i>	540	180	33%
<i>Jatropha carcus</i>	120	40	33%
<i>Melia azaderach</i>	150	50	33%
<i>Moringa oleifera</i>	150	50	33%
<i>Senna siamea</i>	750	250	33%
<i>Senna spectabilis</i>	210	70	33%
<i>Sesbania sesban</i>	450	150	33%
<i>Tephrosia vogelii</i>	60	20	33%
<i>Terminalia sericea</i>	210	70	33%
<i>Toona ciliata</i>	1,350	450	33%
<i>Trichilia emetica</i>	120	40	33%
<i>Ziziphus abyssinica</i> (depulped)	210	70	33%
<i>Ziziphus mauritiana</i> (depulped)	210	70	33%
Tree seed (average price/species, kg):	312	104	33%
Polytubes by size ('000):			
6 x 4"	175	175	100%
8 x 6"	650	650	100%
Training Fee per Participant/Day			
Line levels #	120	120	100%
Training kits #	12,500	5,000	40%
Posters #	60	30	50%
Booklets #	400	200	50%
Manuals #	800	400	50%

APPENDIX 2: USAID MAFEP/SOI PARTNERS AND COLLABORATORS

Partner Organizations	Head office location	Site(s) located	No. of sites	Type of support¹
Research Collaborators				
Department of Agricultural Research	Lilongwe			IS, R
Bunda College of Agriculture	Lilongwe			IS, R
Forestry Research Institute of Malawi (FRIM)	Zomba			IS
Int'l Center for Research in Semi-Arid Tropics	Chitedze			GM, R, IS
Int'l Center for Research in Agroforestry	Makoka			E/TM, M&E, IS
NGOs				
Evangelical Lutheran Dev. Program (ELDP)	Blantyre	Lilongwe	5	E/TM, GM, M&E, T
		Dedza	1	E/TM, GM, M&E, T
		Blantyre	1	E/TM, GM, M&E, T
		Chikwawa	1	E/TM, GM, M&E, T
		Mzimba	1	E/TM, GM, M&E, T
Lutheran Mobile Clinic (LMC)	Lilongwe	Lilongwe	4	E/TM, GM, M&E, T
Concern Universal (CU)	Blantyre	Dedza	5	E/TM, GM, T
CCAP Livingstonia	Ekwindeni	Mzimba	4	E/TM, GM, M&E, T
		Rumphi	1	E/TM, GM, M&E, T
		Kasungu	2	E/TM, GM, M&E, T
		Nkhata Bay	1	E/TM, GM, M&E, T
Canadian Physicians for Aid and Relief (CPAR)	Lilongwe	Lilongwe	1	E/TM, GM, M&E, T
World Vision Malawi (WVI)	Lilongwe	Mchinji	6	E/TM, GM, M&E, T
		Mzimba	10	E/TM, GM, M&E, T
		Rumphi	12	E/TM, GM, M&E, T
		Lilongwe	8	E/TM, GM, M&E, T
		Nkhota-kota	6	E/TM, GM, M&E, T
		Blantyre	5	E/TM, GM, M&E, T
		Thyolo	4	E/TM, GM, M&E, T
		Kasungu	12	E/TM, GM, M&E, T
		Ntchisi	8	E/TM, GM, M&E, T
		Chitipa	7	E/TM, GM, M&E, T
		Zomba	7	E/TM, GM, M&E, T
InterAide	Nkhoma	Lilongwe	1	E/TM, GM, M&E, T
Christian Service Committee (CSC)	Lilongwe	Districts	17	E/TM, GM, M&E, T
CSC/Women Border Area Dev. Program	Mulanje	Phalombe	1	E/TM, GM, T
Greenline Movement	Machinga	Machinga	1	E/TM, GM, T
Self Help Development International	Linthipe	Dedza	1	E/TM, GM, M&E, T
Africare	Ntcheu	Ntcheu	1	E/TM, GM, M&E, T
CARE International	Lilongwe	Lilongwe	2	E/TM, GM, IS, T
		Dedza	2	E/TM, GM, IS, T
		Dowa	1	E/TM, GM, IS, T
MOVIMONDO	Mangochi	Lungwena	1	E/TM, GM, M&E, T
		Mpilipili	1	E/TM, GM, M&E, T
Total LandCare Malawi	Lilongwe	Lilongwe	2	E/TM, GM, M&E, T
Development Aid from People to People (DAAP)	Blantyre	Chiradzulu	1	E/TM, GM, M&E, T
National Initiative for Civic Education/PAC	Lilongwe	Lilongwe	1	E/TM, GM
		Dedza	1	E/TM, GM
Catholic Relief Services/CADECOM	Blantyre	Chikwawa	1	E/TM, GM, M&E, T
		Phalombe	1	E/TM, GM, M&E, T
OXFAM-GB	Mulanje	Mulanje	1	E/TM, GM, M&E, T
Community-based Organizations				
Bwanje Environmental Rural Dev. Org (BERDO)	Bwanje	Bwanje	1	E/TM, FTS, GM, M&E, T
Bilira Afforestation Project	Bilira	Bilira	1	E/TM, GM, T
Private Sector				
Agricultural Research and Extension Trust	Lilongwe	Districts	EPAs	E/TM, GM, IS
TEAM Tree Project	Bunda	Bunda	1	E/TM, GM, M&E, T
	Blantyre	Blantyre	2	E/TM, M&E, T
Limbe Leaf Tobacco Company	Lilongwe	Lilongwe	1	E/TM, GM, T
Mozambique Tobacco Leaf Company	Villa Ulongwe	Villa Ulongwe	6	E/TM, GM, T
¹TYPE OF SUPPORT				
E/TM = Extension/training materials		FTS = Field technical support		
IS = Information Sharing/Meetings		M&E = Community-based monitoring and evaluation		
GM = Germplasm		R = Research and technology development		
T = Training in agroforestry, soil conservation and nurseries		GF = Grant funds		

Partner Organizations	Head office location	Site(s) located	No. of sites	Type of support ¹
GOM & Project Partners				
Karonga ADD		Karonga	EPAs	E/TM, FTS, GM, M&E, T
Mzuzu ADD		Mzuzu	EPAs	E/TM, FTS, GM, M&E, T
Kasungu ADD		Kasungu	EPAs	E/TM, FTS, GM, M&E, T
Lilongwe ADD		Lilongwe	EPAs	E/TM, FTS, GM, M&E, T
Salima ADD		Salima	EPAs	E/TM, FTS, GM, M&E, T
Machinga ADD		Machinga	EPAs	E/TM, FTS, GM, M&E, T
Blantyre ADD		Blantyre	EPAs	E/TM, FTS, GM, M&E, T
Shire Valley ADD		Shire Valley	EPAs	E/TM, FTS, GM, M&E, T
PROSCARP	Lilongwe	All ADDs	21	E/TM, FTS, GM, M&E, IS, T
Department of Forestry	Lilongwe	Districts	23	E/TM, GM, IS, T
Department of Agricultural Extension Services	Lilongwe	All ADDs	21	E/TM, FTS, GM, M&E, IS, T
Department of Environmental Affairs	Lilongwe	Lilongwe	-	IS
Department of National Parks	Lilongwe	Lilongwe	-	IS
National Smallholder Farmers Association of Malawi (NASFAM)/SADP	Lilongwe	Rumphi	3	E/TM, FTS, GM, M&E, T
		Kasungu	3	E/TM, FTS, GM, M&E, T
		Ntcheu	2	E/TM, FTS, GM, M&E, T
		Namwera	3	E/TM, FTS, GM, M&E, T
		Zomba	3	E/TM, FTS, GM, M&E, T
		Mulanje	3	E/TM, FTS, GM, M&E, T
Malawi Social Action Fund (MASAF)	Lilongwe	Lilongwe	1	E/TM, GM, IS
Lake Chilwa Wetland & Catchment Mngt Project	Zomba	Machinga	EPAs	E/TM, FTS, GM, M&E, T
		Zomba	EPAs	E/TM, FTS, GM, M&E, T
		Phalombe	EPAs	E/TM, FTS, GM, M&E, T
EU-Public Works Program	Lilongwe	Lilongwe	180	E/TM, FTS, GM, M&E, T
		Dowa	100	E/TM, FTS, GM, M&E, T
Peace Corps	Lilongwe	All Districts		E/TM, GM, T
Border Zone Development Project	Mzuzu	Rumphi	EPAs	E/TM, FTS, GM, M&E, T

¹TYPE OF SUPPORT
E/TM = Extension/training materials FTS = Field technical support
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GM = Germplasm R = Research and technology development
T = Training in agroforestry, soil conservation and nurseries GF = Grant funds

Partner Organizations	Head office location	Site(s) located	No. of sites	Type of support ¹
GOM & Project Partners				
Parties Requesting Information, Training and/or Germplasm				
EU Social Forestry Project	Lilongwe	All Districts		E/TM, IS, T
Plan International	Lilongwe	Districts	3	E/TM, GM
Mvera Christian Group (Chezi Catholic)	Chezi	Dowa	1	E/TM, GM, T
Nkhoma Synod	Nkhoma	Nkhoma	1	E/TM, GM, T
Mlanzi Orphan Care	Mponela	Dowa	1	E/TM, GM, T
Chanzi Youth Club	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Chisoti Youth Organization	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Nkhota-Kota Youth Organization	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Nkhota-Kota Pvt. Institute of Education	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Tambala Youth Club	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Thale Youth Club	Nkhota-Kota	Nkhota-Kota	1	E/TM, GM
Children Youth Organization Ladders	Ntchisi	Ntchisi	1	E/TM, GM
Better Malawi Youth Organization	Chiwamba	Lilongwe	1	E/TM, GM, T
Chitsanzo Bee Keeping Organization	Lilongwe	Lilongwe	1	E/TM, GM, T
Friends of Lilongwe Nature Sanctuary	Lilongwe	Lilongwe	1	E/TM, GM, T
Rural Foundation for Afforestation	Mzuzu	Rumphi	1	E/TM, GM
Titani Rural Youth Support Organization	Chingale	Zomba	1	E/TM, GM
Active Youth Initiative Social Enhancement	Blantyre	Blantyre	1	E/TM, GM

¹TYPE OF SUPPORT
E/TM = Extension/training materials FTS = Field technical support
IS = Information Sharing/Meetings M&E = Community-based monitoring and evaluation
GM = Germplasm R = Research and technology development
T = Training in agroforestry, soil conservation and nurseries GF = Grant funds

APPENDIX 3 : TREE SEED AND POLYTUBES DISTRIBUTED TO PARTNERS FOR THE SEASON 2000/01

ORGANISATION	Amount (kg) Distributed by Species																			Tubes		
	<i>Acacia galepinii</i>	<i>Acacia polyacantha</i>	<i>Acacia seberiana</i>	<i>Azela quansensis</i>	<i>Albizia lebbeck</i>	<i>Albizia zimmermanni</i>	<i>Bauhinia thonningii</i>	<i>Girardinia septium</i>	<i>Jatropha curcas</i>	<i>Khaya anthotheca</i>	<i>Melia azadirach</i>	<i>Moringa oleifera</i>	<i>Seneca siamea</i>	<i>Seneca spectabilis</i>	<i>Sesbania sesban</i>	<i>Terminalia sericea</i>	<i>Toona ciliata</i>	<i>Zizyphus abyssinica</i>	<i>Zizyphus mauritiana</i>		Total General Tree Seed	<i>Faidherbia albida</i>
Anna C. Bosch (Peace corps)									0.5	10.3	4.5		0.0	0.0					15.4	0.2	5	8,500
ARET												1.0							1.0			
Balaka RDP	4.2	3.0					3.0	56.3			6.4	0.9	33.9						107.7	15.7		
Blantyre ADD																						500,000
Blantyre RDP		2.4											0.8						3.2	6.5	15	31,000
Bobbie (Peace Corps)				10.0								0.3							10.3	6.0	3	
Border Zone- Rumpfi		0.9		32.4					27.8			0.4	0.7		0.4		12.0	2.4	76.9	3.5	40	224,200
Buy Button (Peace Corps)		1.8		32.0			0.2					0.3	0.3						34.6	0.2	5	23,000
Bwanje RDP												4.0							4.0	13.9		
Bwanje Rural Dev.Program	41.7	181.8		200.0	41.2		19.7		20.1	68.6	1.8	12.1	35.6		7.7	2.0			632.2	61.7		1,000,000
CARE INTERNATINAL		6.1		80.0		6.8			20.1			5.5	8.4						126.9	8.7		355,000
Central Mzimba RDP													6.1						6.1	8.7		60,000
Chaima, Lilongwe East RDP		1.2					0.2					0.4	0.2						2.0	1.2	100	15,606
Chikuse, Lilongwe East RDP		2.4					2.1					0.6	1.8						6.9	2.4		66,810
Chikwawa RDP	25.0	12.1										0.6							37.7	17.4		
Chilamba/Kanyama MAFE		0.9		4.0								0.1	0.2						5.2	0.9		10,000
Chimunda (Malingunde)		0.3										0.2	1.3						1.8	0.1		5,000
Chiradzulu SHID												4.8	9.4						14.2			
Chisoti Youth Organisation	0.4	0.3		4.0	0.7	0.3			1.0		0.9	0.1	0.1						2.0	9.8	0.9	14,000
Chitedze																					5	
Chitipa (KRADD)		3.0		20.0								1.8	2.6						27.5	11.7		80,000
Chitipa RDP									20.1			2.4							22.6	23.9	0	80,000
Chiwamba EPA		1.0										1.0	1.0						3.0		50	
CIMMYT																					20	
Colleen Harrington (Peace Corps)	0.4			2.0	0.3				1.0	1.7		0.1	0.1		0.8		20.0		26.4	0.4		9,500
Concern Unversial Thiwi Lifidzi	6.7	4.8		32.0			2.0				21.3		1.9						68.7	13.0		
CRS Chikwawa		1.2		85.0	26.7				40.3		71.1	5.5	7.5						237.2	52.2	90	500,000
CRS MAIN UNIT																					300	
CRS Phalombe		0.1		25.0	1.3				8.1			18.2	23.6						76.3		30	500,000
CSC/WBADP Mulanje	4.2	6.1			3.3		9.8					1.2	1.9						26.5	8.7	250	
DAPP		20.9		50.0	23.0				69.5	116.6		4.1	6.4						290.4	30.0		348,000
Debbie Sontag					0.7		1.7					0.1	0.2	6.0					8.8	2.2		16,000
Dedza (LADD) Land Resources		15.5							17.1			13.2							45.8	36.5		370,000
Dedza DFO												29.0	9.3						38.3	4.8		
Dedza RDP		3.6		3.2			2.0					0.4	0.8						9.9	1.7		34,800
Dereck/Patrick (Peace Corps)	0.4	0.6		8.0								0.1	0.2						9.3	0.7	10	40,900
DFO Lilongwe												36.4							36.4			
DFO Nkhotakota		6.1		100.0	6.7	17.0			20.1				1.4						151.3	15.2		100,000
DFO Nkhotakota (F.C.Mwale)	0.2	0.4		7.0			0.2		2.0										9.9	0.7		7,000
DFO Nicheu Manjawira	3.3	2.4		16.0			0.5		4.0	3.4	2.7	0.5	0.8					33.6	0.9		48,000	
DFO Ntchisi												0.9	0.5						1.4			20,000
Dowa DFO	18.2										36.0		33.0						87.2	21.7		220,000

APPENDIX 3 : TREE SEED AND POLYTUBES DISTRIBUTED TO PARTNERS FOR THE SEASON 2000/01

ORGANISATION	Amount (kg) Distributed by Species																				Tubes			
	<i>Acacia galpinii</i>	<i>Acacia polyacantha</i>	<i>Acacia sebertiana</i>	<i>Azela quanzensis</i>	<i>Albizia lebbeck</i>	<i>Albizia zimmermanni</i>	<i>Bauhinia lhosningii</i>	<i>Citricidia sepium</i>	<i>Jatropha curcas</i>	<i>Khaya antiothea</i>	<i>Melia azedarach</i>	<i>Moringa oleifera</i>	<i>Senna siamea</i>	<i>Senna spectabilis</i>	<i>Sesbania sesban</i>	<i>Terminalia sericea</i>	<i>Toona cilizata</i>	<i>Zizyphus abyssinica</i>	<i>Zizyphus mauritiana</i>	Total General Tree Seed		<i>Faidherbia albida</i>	<i>Tephrosia vogelii</i>	
Dowa East Mlindiza site	8.7	6.8								3.6	3.7		0.6	0.6						25.5	3.1			
Dowa East RDP	18.9	15.1								8.1			5.0	5.2						66.9	6.5			
Dowa West Chikwete II	1.8	1.9		1.2						0.6			1.5	1.1						8.9	4.1	133	58,600	
Dowa West Chikwete III	8.8	4.6		30.0						7.6			4.7	2.5						58.2	9.1	92	177,400	
Dowa West RDP	35.5	24.5								36.7		2.7	15.2	9.5						125.8	15.0	800		
EDETAM	8.3	6.1										8.9		0.9						24.2		35		
ELDP Blantyre		24.4		160.0	18.3								4.2	22.5						229.5	17.4			
ELDP Naminjiwa														4.7						4.7	43.5			
Friends of Lilongwe Nature Sanctuary Golf Club	0.8	0.6		8.0	0.7					2.0			0.3							12.4	0.9		14,000	
Heathen Berlin (Peace Corps)				24.0										0.3	3.4					-			13,000	
Heid Enrich (Naphiri)	1.0	0.5			4.1							0.1		0.2						27.7	1.7	8	15,000	
Inter Aide Agro Nkhoma		5.4			2.4		3.5	5.1					5.4	8.4			0.3			6.0	0.9		8,800	
Jeremiah (Peace Corps)				0.8						0.2			0.0	8.4						1.0	0.1		100,000	
Kajikhomele Kulima Project		0.9											0.4	0.7						1.0	0.1			
Kapininga (Malingunde)	0.2	0.2		0.8	0.3								0.2	0.2				12.0	2.4	16.4	3.5	40	57,000	
Karonga (KRADD) Land Resources		4.5		36.0									1.5	4.7						1.9	0.7	35		
Karonga RDP													1.8							46.7	4.3		80,000	
Kasungu ADD																				1.8	21.7	200	81,000	
Kasungu RDP																				-			300,000	
Kauzirira (Malingunde)		0.1		2.8										5.6	5.7					11.3	10.6	500		
Kaweche (Malingunde)		0.3		2.8										0.1	0.1					3.6	0.5	3		
Kawindula Dairy Society										0.5				0.1	0.1					0.1	0.1	5	3,700	
Kawinga RDP				56.0									2.7	3.6						62.3	17.4			
Kunyinda ADP WVI	1.3	1.8											1.0	1.1						5.2	3.5	80		
LADD																				-		250		
Larry Walker (Peace Corps) Chiradzulu					3.0															5.0		3		
Lilongwe East RDP				20.0			2.5						0.6	1.9						24.9	6.5		55,000	
Lilongwe West RDP	1.8	1.1											0.9	1.3						5.2	1.7		41,480	
Livingstonia Lojwa															10.2					10.2	9.3	15		
LMC	1.0	2.3		10.0					5.1	2.0		0.4	0.8	0.6						22.2	1.1		36,900	
Lucia Miller (Peace corps)										2.0			0.1	0.2						2.3	0.4		8,000	
Lusaka Soil Conservation Unit																				-		50		
Machinga ADD	4.0			10.0											1.0					-	25.0	4.0	20	500,000
Malingunde MAFE/PROSCARP																				-			47,000	
Mangochi APPIP	0.4	2.1		8.0									1.0							11.5	2.2		31,000	
Mangochi RDP		5.6											0.2							5.8	10.4			
Marist Secondary School	0.4	0.3		4.0						0.2										4.9	0.4			
Matt S. Ward(Peace Corps)Chikwawa	0.1	0.2	0.2		0.0	0.8	0.0	0.0		0.1			0.1	0.1				1.0		2.6				
Mbalame village (Lilongwe West)															0.1	1.7				1.8	0.9	95	5,000	
Mbowera (Malingunde)													0.2	0.2						0.4	0.4	45		
Mehinji DFO	25.0	18.2		72.0	20.0					12.1			14.5	11.3						173.1	13.0		600,000	

84

APPENDIX 3 : TREE SEED AND POLYTUBES DISTRIBUTED TO PARTNERS FOR THE SEASON 2000/01

ORGANISATION	Amount (kg) Distributed by Species																		Total General Tree Seed	Faidherbia albida	Tephrosia vogelii	Tubes	
	Acacia gypsinii	Acacia polyacantha	Acacia seberiana	Azadirachta indica	Albizia lebbek	Albizia zimmermannii	Bauhinia thonningii	Gliricidia sepium	Jatropha curcas	Khaya anthotheca	Melia azadirach	Moringa oleifera	Senna siamea	Senna spectabilis	Sesbania sesban	Terminalia sericea	Toona ciliata	Zizyphus abyssinica					Zizyphus mauritiana
Mchinji RDP	37.5	30.3										12.1	8.5							88.4	11.3	600	100,000
Mchinji Zulu Site	12.5	9.7		8.0			4.9				3.4	4.8	4.2							47.6	6.5	258	216,000
Mganja Village																				-		130	10,000
Mkowa (Malingunde)		0.2		0.8								0.1	0.1							1.1	0.7	2	
Mlanzi Orphan Care																				-			200,000
Mndunje Youth Organisation												1.0	1.0							2.0			8,000
Mphunzi (Malingunde)		0.6										0.1	0.1							0.8	0.9	15	
Mponera EPA												3.1	4.7							7.8	54.8	200	
Mr B.J. Nbate																				-			10,000
Mulanje RDP				30.8						7.8		0.5	15.0							54.0	1.3	150	
Mwanza RDP		3.0								7.0		0.5	14.1							24.6	6.5		
Namwera RDP		1.4		24.0					4.2			0.1	0.1							29.8	7.8		31,000
NASFAM	342.0	15.0		55.0	30.0		4.0					27.0	13.0							486.0	64.0	609	1,515,750
Nathan Olah (Peace Corps)Mzimba	0.2	0.2		1.2						0.5	0.1	0.4	0.0	0.0				10.0		12.7	0.4	2	6,300
Ndaula Farmers DFO LI.				88.0	1.7		1.0					1.8	1.9							94.3	7.8		100,000
NICE Dedza				20.0	3.3					5.0		7.3	4.7						170.0	210.3	3.3	5	800,000
NICE DOWA												8.5								8.5	21.7		100,000
NICE Lilongwe				8.0								0.4	0.6							8.9	4.4		30,000
Njande, Lilongwe East RDP		0.3					0.1					0.2	0.1							0.7	0.6		6,544
Njolomole EPA.		1.4		6.6	2.0		1.5					0.7	0.4							12.6	8.9	188	44,970
Nkhata Bay RDP												0.6								0.6	4.3		20,000
Nkhoma Synod																				-		100	
Nkhotakota RDP												7.6								7.6	27.5		100,000
Nsanje RDP	8.8	7.3										3.0	0.1							19.1	13.0	5	
Nicheu (LADD) Land Resources		1.7		4.0			1.5			12.6		1.3	0.2							21.2	8.7		66,000
Nicheu RDP		1.5										0.6	0.9							3.1	1.7		29,000
Ntchisi- Children and Youth Dev. Ladder												0.6	0.9							1.5			30,000
Ntchisi RDP		15.6								12.6		4.9	6.8							39.9	4.1	400	
Oxlam Mulanje	0.9			8.2	0.7					2.1										11.8			
P.C. Dzalanyama																				-			23,000
Phalombe RDP		1.6										0.4	3.6					12.0		17.6	2.3		
PIAN International		20.9		50.0	23.0					69.5										163.4	30.0		
PIAN International Kasungu		0.5		8.0	0.3					2.0							5.0			15.8	5.4	5	
PIAN International Lilongwe		0.5		8.0	0.3					2.0										10.8	0.9		
PIAN International Mzuzu		0.5		8.0	0.3															8.8	0.9		
PROSCARP - BLADD				40.0						10.1		1.2	0.4							51.7	2.2		
PROSCARP - DOWA																				-		200	
PROSCARP - KRADD Misuku Area																				-	13.0		
PROSCARP - MADD												18.2	28.1							46.3	13.0	1278	
PROSCARP - Mponela	3.2	42.4		5.4								17.2	23.3							91.5	57.6	250	
PROSCARP - SALIMA																				-		250	
PROSCARP - SVADD		378.0											11.5							389.5	2.7	315	

APPENDIX 3 : TREE SEED AND POLYTUBES DISTRIBUTED TO PARTNERS FOR THE SEASON 2000/01

ORGANISATION	Amount (kg) Distributed by Species																				Tubes		
	<i>Acacia galpinii</i>	<i>Acacia polyacantha</i>	<i>Acacia sebertiana</i>	<i>Azela quanzensis</i>	<i>Albizia lebbeck</i>	<i>Albizia zimmermanni</i>	<i>Bauhinia thoninii</i>	<i>Gliricidia sepium</i>	<i>Jatropha curcas</i>	<i>Khaya anthotheca</i>	<i>Melia azedarach</i>	<i>Moringa oleifera</i>	<i>Senna siamea</i>	<i>Senna spectabilis</i>	<i>Sesbania sesban</i>	<i>Terminalia sericea</i>	<i>Toona ciliata</i>	<i>Zizyphus abyssinica</i>	<i>Zizyphus mauritiana</i>	Total General Tree Seed		<i>Faidherbia albida</i>	<i>Tephrosia vogelii</i>
PROSCARP Kabwiri SLADD		1.2											1.9	1.9						5.0	26.1	75	
PROSCARP MAIN UNIT																				-		600	
Rae Kozar Malingunde (Peace Corps)													0.9							0.9	0.9	17,000	
Ray Kozar																				-		5,000	
Rumphi (MZADD) Land Resources		6.4		40.0			1.5			10.1			2.1							60.0	12.2	80,000	
Rumphi RDP													0.0	0.2						0.2	6.5	100	
Salima RDP													8.8							8.8	15.0	17,820	
Self Help Dev. Dedza	8.3	3.0		33.0	5.0								4.0				0.2			53.5	9.0		
Shire Valley ADD																				-		50	
Simiyoni (Malingunde)				0.8									0.2	0.1						1.1	0.3	35	
Soil Food and Health Community Ekwendeni																				-		3	
SOM	1.7	1.2											0.2	0.4						3.5	1.7	20,000	
South Mzimba RDP	4.2	6.1											6.1	18.8						35.0	21.7	100,000	
Stephanos Orphanage (Chileka BT)													0.0	0.0						0.0	0.1	25	
Stuart Banashek (Peace Corps)											3.4		0.4	0.1						4.0	2.6	5	
Team Tree Project Blantyre	1.0	1.5		7.2	1.1		1.5						0.5	0.8		1.5				15.1	2.3		
Team Tree Project Lilongwe	2.1	1.5		20.0						20.1			14.5	14.7		3.8				76.7	4.3	270,000	
Thiwi Lifidzi RDP		3.0											1.5	2.2						6.7	6.5	73,000	
Thyolo (BLADD) Land Resources		3.0		50.0			2.5			50.3			3.9	0.9						110.7	17.4		
Thyolo RDP				50.0	65.6									39.4						155.0	137.0	1,160,000	
Tom Cullen (Peace Corps)Kasungu	0.1	5.0	0.2	40.0	0.0	0.8	0.0	0.0		10.2				1.4	7.7			26.0		91.5	1.7	45,000	
VIFOR PROJECT	187.7	67.4		148.0	10.0	10.2	8.4			175.0			48.2	21.1		29.2			86.6	791.7	45.8	446,000	
World Vision International	21.1	68.8		75.2	11.8		7.4	0.7		83.1			28.7	30.0	27.7			190.0	6.8	551.2	57.4	310	
Youth Speakout Organisation Likuni				20.0									0.5							20.5	2.2	5,000	
Zomba RDP				100.0									3.0	53.6						156.7	43.5		
TOTALS	854	1107	0.3	2115	308	36	101	11	61	807	211	159	460	623	52	43	2	528	36	7,514.0	1,422	9,497	12,939,680

APPENDIX 4: Table 1 a

STRATEGIC OBJECTIVE 6:		SUSTAINABLE INCREASES IN RURAL INCOMES ¹	
APPROVED: September 2001		COUNTRY/ORGANIZATION: USAID/Malawi	
INDICATOR: Increased adoption of improved soil conservation and agroforestry practices (specified below).			
UNIT OF MEASURE:			
a) no. of hectares for practices (1) and (2); millions of trees for practice (3)			
b) no. of farm families adopting each practice			
c) % of participating households that are female headed (new indicator starting 1999)			
SOURCE: Washington State University and partner institutions			
1) contour strips of grass/shrubs, reduced tillage, or combinations thereof ¹ ¹ Excludes contour and box/tie ridging since the integration of dense vegetative barriers is vital to reduce erosion and runoff.	YEAR² 2001	PLANNED a) 15,000 b) 50,000 c) 33%	ACTUAL a) 14,316 b) 52,309 c) 30%
	2002 (T)	a) 20,000 b) 70,000 c) 33%	a) b) c)
COMMENTS ON 2001 RESULTS AND 2002 TARGETS: Low achievements relative to targets for area covered for 2002 due to poor coordination to share material which was readily available in some localities but not accessed by those interested. Area targets for 2001 are higher as most partners are committed to outplanting vetiver from new and existing nurseries.			
2) soil-improving trees/shrubs planted in intercropping and/or short-term fallow systems:	2001	a) 23,000 b) 80,000 c) 34%	a) 28,268 b) 96,236 c) 32%
	2002 (T)	a) 40,000 b) 140,000 c) 34%	a) b) c)
COMMENTS ON 2001 RESULTS AND 2002 TARGETS: Targets for 2002 are much higher due to improved participatory action planning with the communities and more partners meeting their own seed requirements through local collection in addition to sourcing from MAFE.			
3) increased tree planting as woodlots and on homesteads/boundaries ³ COMMENTS ON 2001 RESULTS AND 2002 TARGETS: ³ Units are trees in millions planted annually by FF with a 48% survival rate by MAFEP and its partners (not cumulative since many trees die or are felled every year). 2001 results exclude tree planting by the Forestry Dept, except for 5 district forestry offices, which received tree seed and inputs from MAFE. More tree planting is being targeted in 2002 as the amount of seed issued to partners has increased over last year's and more partners are meeting their needs for tree seed through local collection.	YEAR 2001	PLANNED a) 9.8 b) 182,392 c) 31%	ACTUAL a) 9.3 b) 210,865 c) 35%
	2002 (T)	a) 10.0 b) 250,000 c) 35%	a) b) c)
¹ Previously the activity was under SO2: Increased Sustainable Use, Conservation & Management of Natural Resources			
² Year refers to the growing season (i.e. 2001 = 2001/02; 2002 = 2001/02 etc).			

APPENDIX 4: Table 1 b

STRATEGIC OBJECTIVE 6:		SUSTAINABLE INCREASES IN RURAL INCOMES¹		
APPROVED: September 2001		COUNTRY/ORGANIZATION: USAID/Malawi		
INDICATOR: Agroforestry/soil conservation support services provided to partners				
UNIT OF MEASURE: Number (cumulative) except for tree seed since this is used up annually.				
a) number of ADDs/ Govt Depts / Donor Project Partners				
b) number of NGO/CBO partners				
c) number of private sector partners ¹				
d) number of trainers and field staff trained in AF/SC practices				
e) hectareage under vetiver nurseries (includes farmers, groups, govt plots and private estates)				
f) tons of improved grain legume seed distributed to partners annually				
g) tons of tree seed distributed annually to partners				
SOURCE: WSU and partner quarterly/annual reports				
INDICATOR DESCRIPTION:		Year	Planned	Actual
<p>MAFE support to USAID/Govt/NGO/private sector partners to improve/expand the implementation of agroforestry/soil conservation practices with farmers.</p> <p>COMMENTS ON 2001 RESULTS AND 2002 TARGETS:</p> <p>The target of 16 ADDs/Govt Depts/Donor Project partners was exceed as two projects became MAFE's partners within the year increasing the actual to 18.</p> <p>2 new NGOs became MAFE's partners in 2001 increasing the number of NGO/CBO partners to 21 against a target of 19 in 2001.</p> <p>I new private sector partner , Mozambique Leaf became MAFE's partner in 2001 increasing the number to 4. Mozambique Leaf operates in the border district of Villa Ulongwe and pays full cost for the services provided.</p> <p>Training strategy focused on trainers to expand impacts through multiplier effect (numbers shown are trainers directly trained by MAFE).</p> <p>Although the overall result for 2001 was more than that of 2000, less vetiver grass was multiplied than planned. This was due to unrealistic targeting both in terms of focus and area coverage.</p> <p>Crop seed was issued to orphan care organizations and others. During 2001/2002, MAFE will not provide crop seed as there are other organizaions which are better placed to provide this service.</p> <p>Tree germplasm target for 2002 includes Tephrosia vogelii, a short-term tree species. The split is 10 tons of Tephrosia and 10 tons of other tree seed.</p>		2001	a) 16	18
		b) 19	21	
		c) 3	4	
		d) 500	403	
		e) 797	213	
		f) 1	0	
		g) 20	18.4	
		2002 (T)	a) 18	
b) 21				
c) 4				
d) 343				
e) 200				
f) 0				
g) 20				
¹ Previously the activity was under SO2: Increased Sustainable Use, Conservation & Management of Natural Resources				

Appendix 4: Table 1 c

STRATEGIC OBJECTIVE 6: SUSTAINABLE INCREASES IN RURAL INCOMES ¹							
APPROVED: September 2001 COUNTRY/ORGANIZATION: USAID/Malawi							
INDICATOR: Agroforestry technologies and support services tested, evaluated and adapted at the farm level before broad-based extension to farmers.							
UNIT OF MEASURE: Cumulative number of technologies that are (a) undergoing testing, or (b) have completed testing and modification/adaptation with farmers. Note that new technologies may be added for testing in a given year, while others complete testing.							
SOURCE: WSU quarterly and technical reports							
INDICATOR DESCRIPTION: Each technology undergoes on-farm testing with farm communities in multiple sites to identify what technologies work where and why, and what does not. Refinements/adaptations are made to enhance farmer adoption with faster & greater returns and lower costs by better understanding the socio-economic and bio-physical factors that affect adoption. When testing is complete, extension recommendations are made, but improvements may continue in management and species selection. Technologies below are categorized according to their primary function, though many have multiple uses (wood, fodder, thatching etc) with contributions to soil/water conservation.							
NO. TECHNOLOGIES			TECHNOLOGIES/PRACTICES	Extension Suitability			
YEAR	PLANNED	ACTUAL					
1992 (B)	a) 12	a) 12	A. Germplasm multiplication/collection	Countrywide			
	b) 0	b) 0					
1993	a) 13	a) 13	1) Tree nurseries (individual & communal)	Countrywide			
	b) 0	b) 0					
1994	a) 11	a) 11	2) Vetiver nurseries	Countrywide			
	b) 3	b) 3					
1995	a) 6	a) 6	3) Seed banks	Countrywide			
	b) 9	b) 9					
1996	a) 2	a) 2	4) Community seed collection/production	Countrywide			
	b) 14	b) 14					
1997	a) 2	a) 2	B. Soil and Water Conservation	Countrywide			
	b) 15	b) 15					
1998	a) 2	a) 1	5) Contour ridging with A-frame/line level	Small/med gullies			
	b) 15	b) 16					
1999	a) 1	a) 1	6) Gully reclamation ¹	Countrywide			
	b) 16	b) 16					
2000	a) 1	a) 0	7) Contour hedgerows of grass/shrub species	Limited application			
	b) 16	b) 17					
2001 (T)	a) 0	a) 0	8) Reduced tillage & crop residue management	Countrywide			
	b) 17	b) 17					
2002 (T)	a) 1	a)	C. Soil Fertility/Conservation	Countrywide			
	b) 17	b)					
COMMENTS: After several years of testing and adaptation with farmers in different agro-ecological zones, many technologies are ready for extension on a wide or selective scale depending on farmer and location conditions, with species to match the site. Reduced tillage with crop residue management has shown limited potential under Malawi smallholder conditions due to long timeframe required to change soil properties, in fact there is initially a slight drop in crop yields, a deterrent for many farmers. Undersowing <i>Tephrosia</i> with maize has proved effective countrywide, other shrubs tested have limited value either due to establishment/labour costs, low biomass yields, or pests problems. Small-scale irrigation with the treadle pump is under investigation as a high potential, low cost technology to improve food security, diets and incomes.			9) Dispersed-systematic tree interplanting	Countrywide			
			10) Hedgerow/alley intercropping ¹	10-15% of farmers			
			11) Increased use of improved grain legumes	Countrywide			
			12) Improved short-term fallows ²	Selective			
			13) Undersowing legume shrubs with crops	Countrywide			
						¹ Improvements needed for wide and deep gullies.	
						² Limited to farmers with good managerial abilities.	
						³ Limited to farmers with larger farms or plots that are being left idle	
						D. Tree Planting for	
						14) Woodlots/homestead &	Countrywide
						15) Living fences ¹	Selective
						16) Fodder banks ²	Selective
						17) Live farm sheds ³	Selective
			¹ Limited to farmers with crops, trees or animals that need protection.				
			² Limited to farmers with dairy animals in areas with established markets.				
			³ Targeted at growers of cash crops for curing sheds and barns.				
			E. Small-scale Irrigation with the Treadle Pump				
			18) Plot and channel layout on different slopes/soils to improve labour and water-use efficiency with minimal risk of water waste and erosion	Dambo area, Countrywide			

¹ Previously the activity was under SO2: Increased Sustainable Use, Conservation & Management of Natural Resources

**APPENDIX 5: HIGHLIGHTS OF THE ANNUAL CONFERENCE OF LAND RESOURCES
CONSERVATION DEPARTMENT, JUNE 23 – 29, 2001**

MAFE participated in the LRC Departmental conference which reviewed field activities and strategies to improve program implementation. Relevant deliberations include the following:

- A presentation by MAFE on strategies for scaling up adoption of agroforestry technologies, some of which include:
 - a) Improving coordination and policy support from LRCD and NASC, in particular by guiding and coordinating R&D among service providers; providing appropriate incentives to aid adoption; increasing the NRM profile within the MAI.
 - b) Improving extension and training services by mandating every EPA and District Forestry Office to target at least one manageable area/community to produce visible and quality results; provide the resources and support for staff to carry effective extension.
 - c) Increasing field level support by organizing management and supervision with clearly defined staff responsibilities and accountability for results; build capacity and expertise through quality staff training and provision of accurate, up-to-date extension materials to effectively transfer skills and knowledge to farmers; ensure community participation at all stages; increase germplasm and build community self-sufficiency; set targets that are feasible and sustainable.
- Some of the relevant conference resolutions include:
 - a) Implement best-bet agroforestry practices in each EPA on an impact area basis.
 - b) Agroforestry and soil conservation practices should be offered to the target communities as a package.
 - c) ADDs should ensure timely delivery of inputs, particularly tree seed, polytubes and other nursery materials.
 - d) Increase follow-ups to target sites to ensure that seed has been delivered and planted by the communities.

APPENDIX 6: HIGHLIGHTS OF THE ANNUAL PARTNER REVIEW MEETING, JULY 31 – AUGUST 2, 2001

The annual review meeting was held to discuss how to streamline partner support services for sustainability, review last season's field results by partners and targets for 2001/02, discuss and evaluate implementation problems and other issues affecting results and develop a plan of action to address key issues/problems. The meeting was attended by government/project, NGO and CBO partners. USAID and pressmen from MBC, Daily Times and TVM were also in attendance.

Below are some of the main issues raised and recommendations made:

Cost-Sharing for Services Provided by MAFE

A cost-sharing arrangement was introduced to give value to the services provided by MAFE and to sustain them after the project closes in 2002 based on real market demands. This was generally viewed as a welcome development by all partners. One issue raised was that Government organizations do not contribute to the costs of these services because MAFE is a donor-funded project under the Ministry of Agriculture.

After considerable deliberation, it was agreed that all government and non-governmental organizations should pay for the full cost of these services after MAFE closes in July 2002. This will be done through the Resource Center which is being established by MAFE to continue these services under the Land Resources Conservation Department, or as an autonomous entity.

Strengthening Collaboration and Coordination

The main issue here is lack of effective coordination among government agencies and NGOs in all forms of development activities. A related factor is that several donors have projects or activities addressing common problems or needs in the same areas with the same communities. This has led to duplication of efforts and conflicts in extension approaches and messages.

Recommendations include:

- Donors should meet on a regular basis to share information on their geographic and programmatic areas of focus, including development approaches used, to minimize duplication and conflicts.
- District Assemblies should assume greater responsibility in coordinating agricultural and NRM activities, but need to have qualified staff to provide the required leadership and technical expertise.
- The Environmental District Officer at the district assembly should take the lead role in coordinating all activities related to agriculture and natural resources within the district. A key action to facilitate this function is to hold quarterly meetings among all implementing agencies within the district to share experiences, review progress, and resolve problems.
- Reports and publications should be circulated to all implementing agencies within the district, with a copy kept at the district assembly for public reference.
- Until agriculture is formally integrated within the District Assembly, ADDs should consolidate field results from all implementing agencies involved in agriculture and NRM activities.
- Training should focus on widening the knowledge base but targeting people in position to make good use of the skills and knowledge gained.

Technology Development

There is a continuing need to regularly review and refine technologies in view of changing community and environmental needs. In this context, it was recommended that:

- Modifications/improvements be communicated to all parties through leaflets, meetings, radio messages, circulars, and self-sponsored short courses
- Regular field visits should be made to sites of implementing agencies by qualified personnel from LRCD to ensure that field programs are technically sound.

Incentives

Implementing agencies are using inappropriate and unsustainable incentives to encourage farmers to adopt new practices. In most cases, such practices are discontinued once the incentive is removed. The result destroys community ownership of the program, and undermines efforts of others that encourage adoption based on the merits of the practices targeted.

Incentives regarded as inappropriate include:

- Cash payments in the form of investment funds and allowances for attending training sessions or meetings
- Food for work programs (to promote agricultural or conservation practices as opposed to community self-help initiatives such as building roads, bridges, schools and clinics)
- Provision of refreshments and food during meetings with communities
- Provision of free inputs such as tree seedlings, fertilizers, crop seed
- Rewards for adoption, e.g. fertilizer inputs for contour ridging and planting vetiver grass; payment for raising tree seedlings

In light of the problems encountered, Government and donors should develop clear guidelines on appropriate types of incentives and modalities for their administration. Since this is an issue that affects all government agencies and NGOs, leadership in this initiative should be the responsibility of a higher body of government, such as Treasury or the National Economic Council. Donors should review their own programs and approaches with transparency to help resolve the issue.