



MANAGEMENT FOR ADAPTATION TO CLIMATE CHANGE

ANNUAL TECHNICAL REPORT: AUGUST 2011 TO JULY 2012



Conventional tillage with tied ridges to reduce runoff: note the standing water in the compacted furrows and runoff in the foreground



Conservation Agriculture in adjacent field, same day and time, showing total infiltration of rain (no standing water or runoff)

Submitted to the Royal Norwegian Embassy

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Total LandCare

With support from

TLC Field and District Assembly Staff from all 5 Districts

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	II
EXECUTIVE SUMMARY	1
1. INTRODUCTION.....	3
1.1 Purpose.....	3
1.2 Key Objectives	3
1.3 Target Areas	3
2. TRAININGS AND MEETINGS	5
3. FIELD RESULTS.....	6
3.1 Community Participation	6
3.2 Gender Participation	6
3.3 Community Based NRM Associations.....	6
3.4 Forestry.....	6
3.5 Sustainable Agricultural Practices	10
3.6 Irrigation and Crop Diversification.....	12
3.7 Chia Lagoon Fisheries Management Association	13
3.8 Livestock Production.....	14
3.9 Ecosystem Monitoring/Research & Development	14
4. ACKNOWLEDGEMENTS.....	15

ACRONYMS AND ABBREVIATIONS

ACE	Agricultural Commodity Exchange
ADP	Agricultural Development Program, Min. of Agriculture & Food Security
APS	Annual Program Statement
BERL	Bio-Energy Resources Limited
CARE	CARE International
CBNRM	Community-Based Natural Resources Management
CBO	Community-Based Organization
CHIA	Chia Watershed Management Project, USAID
CISANET	Civil Society for Agricultural Network
COMPASS	Community Partnerships for Sustainable Resource Management, USAID
CRS	Catholic Relief Services
CIMMYT	International Maize and Wheat Improvement Center
DA	District Assembly
DEC	District Executive Committee
DFC	District Field Committee
DMC	District Management Committee
DNPW	Department of National Parks and Wildlife
EAD	Environmental Affairs Department
EPA	Extension Planning Area
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FD	Forestry Department
GHG	Green House Gases
GIS	Geographical Information System
GOM	Government of Malawi
GTZ	German Agency for Technical Cooperation
GVH	Group Village Head Person
ICRAF	International Centre for Research in Agroforestry
ICRISAT	International Centre for Research in the Semi-Arid Tropics
IDEAA	Initiative for the Development of Equity in African Agriculture
IITA	International Institute for Tropical Agriculture
MACC	Management for Adaptation to Climate Change, Norwegian Government
M&E	Monitoring and Evaluation
MoAFS	Ministry of Agriculture and Food Security
MSMEs	Micro, Small and Medium Enterprises
NASFAM	National Smallholder Farmers Association of Malawi
NGO	Non Governmental Organization
NRB	Natural Resource Based
NRM	Natural Resource Management
PA	Protected Area
PLWHA	People Living With HIV/AIDS
PSC	Project Steering Committee
RNE	Royal Norwegian Embassy
SSLPP	Small Scale Livestock Promotion Project
TA	Traditional Authority
TLC	Total LandCare
USAID	U.S. Agency for International Development
VNRMC	Village Natural Resources Management Committee
VS&L	Village Savings and Loans
WESM	Wildlife and Environmental Society of Malawi

EXECUTIVE SUMMARY

Introduction and Organization of the Annual Report

The overall goal of the MACC Project is to improve the livelihoods of rural communities in the central watersheds of Lake Malawi. A key focus is to reduce their vulnerability and risk to climate change by building capacity to increase food security, diversification, and income generation consistent with sound management of land and water resources.

This Annual Report covers the period August 2011 to July 2012. The structure of the report is organized as follows:

1. **The Technical Report** covers field results from August 1 2011 to July 31 2012.
2. **The Financial Expenditure Report** documents the expenditures by line item against the budget through July 2012 with explanations of under and over- expenditures.

Meetings and Collaborative Activities

- **Project Review Meetings:** The formal annual review meeting with the RNE, District Commissioners and TLC was held in March 2012 with the aim a) to review results from 2010/11 and the workplan for 2011/12, and b) to evaluate weaknesses with the project and how these could be addressed. The minutes of this review meeting were prepared and signed by both parties. Key points on areas for improvement were 1) to more effectively document participation by women, 2) to demonstrate how the project is reaching out to households affected by HIV/AIDS, and 3) to document impacts of interventions in terms of improvement in people's livelihoods and general well being. Comments and suggestions from this meeting were incorporated into revisions of the Annual Report for 2010/11 and the Workplan and Budget for 2011/12.

Several other meetings were held between TLC and the Royal Norwegian Embassy to discuss progress with the project and its future under the HEAL program led by the Development Fund of Norway (discussed below).

- **New HEAL Program with Other Norwegian funded Projects:** The Development Fund of Norway has continued working with TLC, LEAD and SCC to develop and finalize the new HEAL program (Harmonization for Enhanced Livelihoods). Each organization developed full 5 year workplans and budgets for review and integration into a coordinated program of work led by DF.

The final plan for HEAL involves a 5 year program which will start in April 2013. Given that the current financial year for MACC ends July 31 2012, TLC submitted a 9 month workplan and budget to bridge the gap until the HEAL program starts. This workplan and budget has been reviewed and approved by the RNE.

- **National CA Task Force:** TLC continues to be an active member of the NCATF in Malawi with responsibility for technical contributions on best practices in different agro-ecological zones. The NCATF has met several times during the past year, all attended by TLC. One key meeting involved a presentation by TLC to all task force members on guidelines to implement CA with smallholder farmers in Malawi, which included a clear definition of CA and how other conservation practices can be incorporated to enhance the benefits of CA. In October 2012, TLC also presented 2 papers at the National Symposium for CA in Malawi.

- **Project Audit Report:** The annual audit report for 2011/12 will be conducted in February 2013 after completing the calendar year. It will then be submitted under separate cover to the RNE in March 2013.
- **Conservation Agriculture Regional Program (CARP):** TLC is the Malawi implementing partner for the regional Norwegian initiative with COMESA to scale up CA in Malawi, Kenya and Uganda. The project has just completed the first of a 4 year program with the CFU in Zambia as the coordinating body. TLC is the implementing the program in 20 EPAs across all 3 regions of the country.
- **Building Resilience to Climate Change:** TLC is undertaking a new project on CA with funding from DfID modeled after the CARP Project, but targeting smallholder households in different districts and EPAs. The project got off to a rather slow start due to funding delays and the use of a 3rd party for all procurement. TLC has recruited and put in place management and field staff in all targeted sites. The challenge is that project vehicles and motorbikes were procured only in December 2012 which limited TLC's ability to identify, mobilize, train and support farm households on the ground. Procurement and distribution of CA inputs has also been delayed due to contracting a 3rd party. TLC is working with DfID to resolve these logistical challenges.
- **Stakeholder Engagement:** A major aim of MACC is to coordinate its programs with other interested parties and organizations to strengthen our respective activities and to share experiences, knowledge and lessons. In order to identify potential collaborators, several group and individual meetings were held to determine common areas of interest and to define the specific roles and activities appropriate for each organization to maximize the resources available, human and physical. To facilitate collaboration, meetings are being held with a broad range of organizations from Government, donor projects, NGOs and private firms to with the aim to more fully engage relevant parties in the project. Collaborative relationships of this nature will complement our comparative strengths to increase effectiveness and impacts of project activities.

Good progress continues to be made to collaborate with Government Departments, District Assemblies, communities, other donors, projects, and NGOs. This is critical to increase opportunities to reach more people, to improve effectiveness and impacts.

Three projects in particular are noteworthy:

1. The USAID Kulera Biodiversity Project with communities around 4 protected areas: Nyika-Vwaza NP, Nkhotakota WR, Ntchisi FR and Mkuwazi FR. The latter 3 PAs all fall within the project area of MACC, hence collaboration is essential to share resources and costs for greater efficiency and effectiveness.
 2. The CARP Project funded by the Royal Norwegian Embassy in Zambia (see above). This project is focused on conservation agriculture and its incorporation with proven agroforestry systems.
 3. The DfID project on building resilience to Climate Change (see also above). This project also focuses on CA with agroforestry but includes a component on irrigation component as well as rainfed agriculture.
- **Capacity building** continues with District Assemblies, Government Agencies, collaborating NGOs and projects, CBOs, and targeted communities. Details on trainings and meetings held within the districts are summarized in table form in this report.

1. INTRODUCTION

1.1 Purpose

The aim is to improve the livelihoods of rural communities within a context that develops and secures the capacity of rural communities for adaptation to climate change in a manner that is productive and sustainable. The underlying principles entail an integrated holistic approach with a three-point thrust:

- ➔ To reduce risks and vulnerability from erratic and unpredictable changes in climate.
- ➔ To improve food security, nutrition, and general well-being of rural communities.
- ➔ To assist farm households in making the transition from subsistence survival to a business oriented mind-set that promotes self-sufficiency and growth.

1.2 Key Objectives

The elements outlined above will be implemented to achieve the following objectives using TLC's successful model of extension and training:

- ➔ Reduce deforestation by improving the economic use and management of natural resources to supply wood energy and construction materials to meet farm and household needs on a sustainable basis focusing on the following interventions:
 - Tree planting with a concentration at the household level to build self-sufficiency.
 - Sustainable management of natural woodlands and trees.
 - Introduction of energy-saving stoves to reduce wood use and the burden on women and girls for fetching wood from areas far from the household.
- ➔ Improve household food security, nutrition, and incomes by increasing and diversifying farm productivity with low input costs through a) crop diversification, b) winter irrigation, and c) integration of livestock.
- ➔ Develop opportunities to establish and operate rural-based enterprises with strong links to sound markets to increase opportunities for self-sufficiency and prosperity.

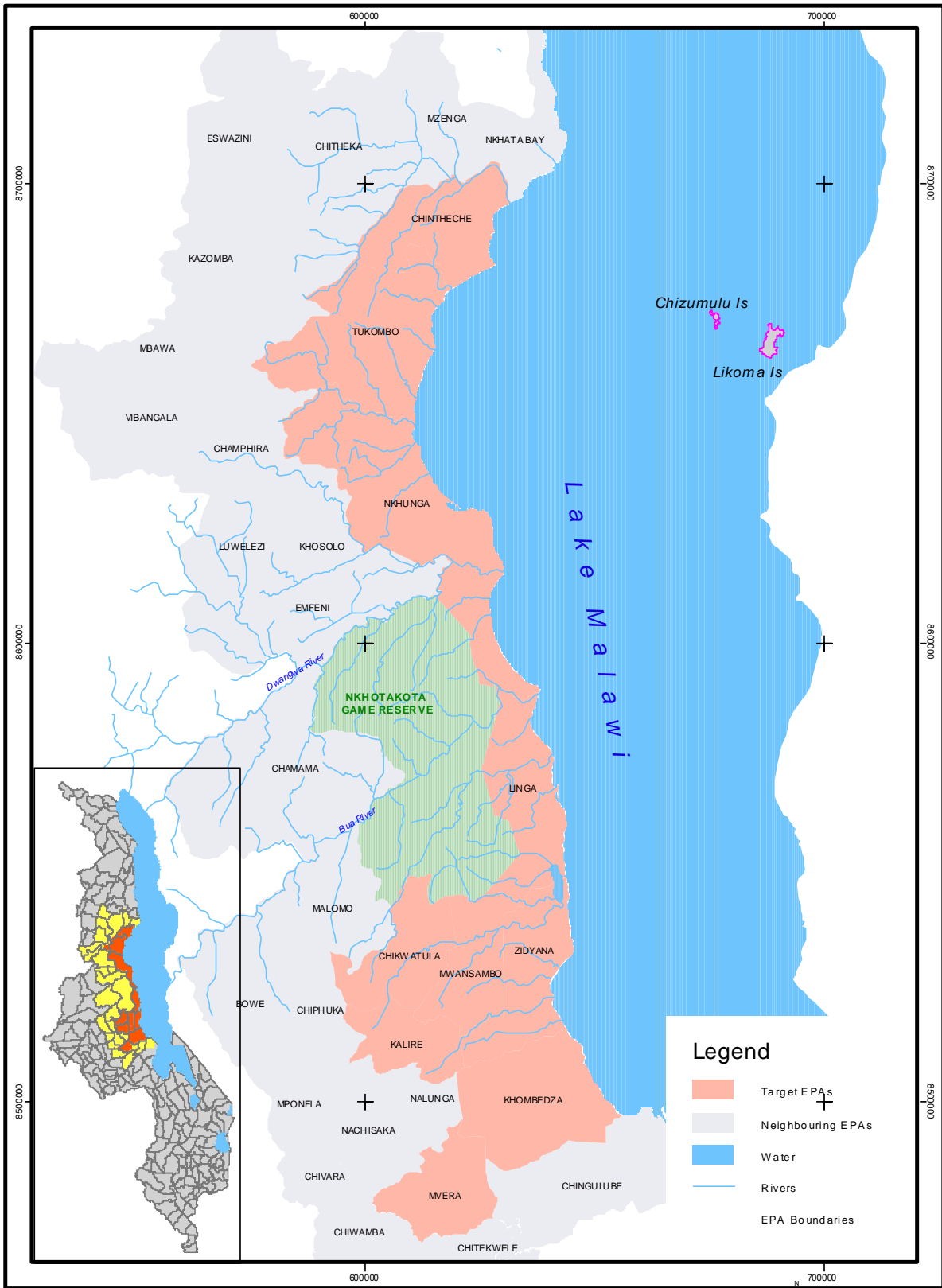
All interventions are implemented using sound land and water management practices to ensure sustainability. The benefits realized by communities accrue from the synergistic effects of a holistic approach with diverse interventions. This will reduce vulnerability and risks to climate change. Impacts will attract interest from adjacent communities, as well as buy-in from other donors and organizations to expand the program to other areas of Malawi.

1.3 Target Areas

The project covers 11 Extension Planning Areas (EPAs) across 5 districts with diverse farming systems and agro-ecological zones (see **Map 1**). The districts and EPAs are shown below (Note: Khombedza was split to include Mtosa; Malomo replaced Chikwatula in Ntchisi and Nachisaka replaced Mvera in Dowa due to other TLC projects in these EPAs).

- Nkhata-Bay District: Chintheche and Tukombo EPAs
- Ntchisi District: Malomo and Kalira EPAs
- Nkhotakota District: Nkhunga, Zidyana, Linga and Mwansambo EPAs
- Salima District: Khombedza and Mtosa EPAs
- Dowa District: Nachisaka EPA

Map 1: Geographic Coverage of MACC showing Districts and EPAs



2. TRAININGS AND MEETINGS

Table 1 summarizes all trainings, meetings, field days and field tours conducted for field staff, partner organizations and communities. These activities are critical to ensure that capacity is built for sustainability through hands-on experience in all technologies. This is reflected in the quality of implementation during the year.

Table 1: Trainings and Meetings, August 2011 to July 2012

MEETINGS/TRAININGS	Nature of Training	Participants (# People)			Total Participants (includes Leaders)		
		# Courses	# Govt	# NGO	# Project	# Male	# Fem
Staff Training	# Courses	# Govt	# NGO	# Project	# Male	# Fem	Total PPs
Extension /Training Approaches	1	0	0	2	2	0	2
CBNRM / Co Mgt	1	18	0	0	14	4	18
Forestry Nurseries / Tree Planting	8	54	1	11	43	23	66
Natural Regeneration	2	26	1	4	20	11	31
Improved Wood Stoves	7	45	5	9	36	23	59
CA/ Agroforestry / Veiver	4	19	2	5	12	14	26
Crop Diversification	3	15	1	1	9	8	17
Irrigation	3	18	3	0	8	13	21
Livestock Production & Marketing	2	17	1	3	12	9	21
Enterprise Development	1	11	1	0	4	8	12
Business Skills & Marketing	2	5	0	6	9	2	11
Community Sensitization Meetings	# Meetings	# Villages	# Leaders	# Villagers	# Male	# Fem	Total PPs
General	34	155	145	3 288	1 903	1 530	3 433
CBO Structure/Constitutions/Bye-Laws	23	364	377	4 914	2 220	3 071	5 291
Forestry Nurseries / Tree Planting	380	1 311	1 191	21 902	12 795	11 027	23 822
Natural Regeneration	101	244	238	4 172	2 363	2 047	4 410
Improved Wood Stoves	270	442	1 042	12 223	6 949	6 316	13 265
CA/ Agroforestry / Vetiver	137	466	516	6 398	4 317	2 597	6 914
Crop Diversification	125	334	408	5 066	3 531	1 943	5 474
Irrigation	145	286	257	4 548	3 136	1 669	4 805
Livestock Production & Marketing	59	101	82	1 643	932	793	1 725
Enterprise Development	12	50	185	1 445	1 121	509	1 630
Business Skills & Marketing	13	58	202	1 477	1 173	506	1 679
CBNRM / Co Mgt	2	4	6	274	112	168	280
Community Training / Demonstrations	# Courses	# Villages	# Leaders	# Villagers	# Male	# Fem	Total PPs
General	1	54	48	986	653	381	1 034
Extension /Training Approaches	5	36	31	402	247	186	433
CBO Structure/Constitutions/Bye-Laws	6	189	205	1 524	1 027	702	1 729
Forestry Nurseries / Tree Planting	111	1 575	1 295	19 352	10 763	9 884	20 647
Natural Regeneration	5	14	31	572	442	161	603
Improved Wood Stoves	78	253	220	8 283	1 859	6 644	8 503
CA/ Agroforestry / Veiver	30	239	218	1 569	1 154	633	1 787
Crop Diversification	28	186	180	3 467	2 262	1 385	3 647
Irrigation	50	143	136	2 413	1 571	978	2 549
Livestock Production & Marketing	17	67	36	543	140	439	579
Enterprise Development	4	13	7	88	50	45	95
Business Skills & Marketing	6	44	61	669	411	319	730
Field Days	# F-Days	# Staff	# Leaders	# Villagers	# Male	# Fem	Total PPs
General	1	15	23	354	176	216	392
Forestry Nurseries / Tree Planting	12	77	135	1 964	1 020	1 156	2 176
Improved Wood Stoves	5	73	117	1 572	755	1 007	1 762
CA/ Agroforestry / Vetiver	4	38	199	1 117	726	628	1 354
Crop Diversification	3	22	46	455	303	220	523
Irrigation	5	9	16	514	293	246	539
Livestock Production & Marketing	9	25	70	672	423	344	767
Natural Regeneration	3	63	99	1 043	520	685	1 205
Field Tours	# Tours	# Staff	# Leaders	# Villagers	# Male	# Fem	Total PPs
Forestry Nurseries / Tree Planting	1	1	9	10	13	7	20
Natural Tree Regeneration & Mgt	1	1	9	10	13	7	20
CA/ Agroforestry / Vetiver	1	2	0	16	16	2	18
Forestry Nurseries / Tree Planting	1	1	9	10	13	7	20
Natural Tree Regeneration & Mgt	1	1	9	10	13	7	20
Natural Tree Regeneration & Mgt	1	1	9	10	13	7	20

3. FIELD RESULTS

Results for 2011/12 are summarized in **Table 2** vs. the annual targets. In most cases, targets were achieved. Exceptions are explained in the narrative for each component described below. As noted in last year's report, eco-tourism, bee keeping, aquaculture and mushroom production have very limited potential for impacting a significant percentage of the targeted beneficiaries. These views are in line with the findings of midterm evaluation of the project. For this reason, the project terminated support for these enterprises.

3.1 Community Participation

The cumulative number of villages and households that have benefitted to date from various project interventions totals 2,436 and 44,381 vs. targets of 2,500 and 45,000 respectively (see **Table 2**).

3.2 Gender Participation

TLC actively seeks to involve women in all trainings and meetings. Results reflect a good gender balance (47% participation by women, see **Table 1**). A key initiative to ensure good participation is to avoid venues away from targeted villages due to cultural barriers by men to allow single or married women to attend such meetings alone. Implementation of most interventions on agriculture and forestry is by necessity a joint endeavor involving all members of the household who are able-bodied and old enough to participate. This is reflected in the results presented in **Tables 3-9**. The rare exceptions to joint gender participation are small enterprises that can be handled individually due to lower labor demands, e.g. bee keeping. Some of these involve more men than women and vice versa.

3.3 Community Based NRM Associations

The formation of new CBNRM associations with co-management agreements has been affected by the institution of a new system with the Departments of National Parks & Wildlife and Forestry. This system involves establishing an umbrella association for each protected area in the country to coordinate all village/community based structures for that PA. Previously registered CBNRM entities around a PA will fall under this umbrella. Villages that wish to join must sign up with the umbrella association which is managed by an executive committee comprising leaders from the border zone of the PA in question and representatives from the Government Department in charge of managing the PA.

The structure is in the process of being harmonized between the two mentioned Departments above. Legal registration of these entities with the Registrar General under the Ministry of Justice takes time, but good progress is being made in terms of organizing the associations for each PA with management plans, constitutions and bye-laws.

3.4 Forestry

Results for the season are shown in **Table 3**. During the season, 1,172 villages and 20,754 households planted a total of 4,030,345 trees and 277,587 bamboo seedlings against a target of 3,750,000 trees and 150,000 bamboo. Participation by women was 46.3%.

Results on natural regeneration at the village, school and individual level totaled 191 ha with a conservative estimate of 318,683 regenerating trees. Participation by women was 47.2%.

TLC has further improved the design of a brick rocket stove with kitchens that have half walls for good ventilation to reduce health risks from smoke. Women are driving this technology. The design is proving to be very popular due to its efficiency, durability, ease of construction, labor savings, and reduced smoke. 3,814 households are using these new stoves against a target of 5000. The challenge has been to retrain all field staff and women farmers. Hence results will increase significantly in due course.

Table 2: MACC: Targets & Results for 2010/11 and 2011/12 (page 1 of 2)

PERFORMANCE INDICATOR	MEASUREABLE INDICATORS OF PERFORMANCE	2010/11			2011-12			Comments
		Targets	Results	% Achieved	Targets	Results	% Achieved	
PARTICIPATION (cumulative figures for villages and households since starting the project)	No. of Participating Villages	2,500	2,407	96.3%	2,500	2,436	97.4%	Results are on track with targets
	No. of Participating Households	45,000	43,768	97.3%	45,000	44,381	98.6%	
TARGETS AND RESULTS BY YEAR								
COMMUNITY-BASED NRM & CO-MGT AGREEMENTS ESTABLISHED AND IMPROVED (support the governance structure of 2 Umbrella Associations)	No. of Participating Villages	500	In process with the Department of National Parks/Wildlife		500	In process with the Department of National Parks/Wildlife		Work is in progress to re-organize the structure and governance of Nkhotakota Wildlife Reserve with community participation
	No. of New Community NRM Associations Formed & Registered	2						
	No. of Co-Mgt Agreements with Constitutions & Bye Laws	2						
	No. of Village Resource Assessments Conducted	2						
	Ha of Forest Areas Demarcated for Cons. & Mgt	400	390	97.5%	300	191	63.5%	Available land for NR is limited
	Estimated No. of Regenerating Natural Trees	600,000	583,770	97.3%	450,000	285,900	63.5%	
	Quantities of Harvestable Products ⁴	NYD	NYD	NA	NYD	NYD		Too early for harvests
	Sales and Income of NR Products ⁴	NYD	NYD	NA	NYD	NYD		
FORESTRY PRACTICES IMPLEMENTED AND ENHANCED	No. of Participating Clubs/Villages	1,250	796	63.7%	1,250	1,172	93.8%	Results in line with or exceeded targets
	No. of Participating Households	25,000	13,573	54.3%	25,000	20,724	82.9%	
	No. of Nurseries Established (includes 50 school nurseries))	1,250	833	66.6%	1,250	1,768	141.4%	
	No. of Tree Seedlings Raised (includes 116,225 school seedlings)	5,000,000	2,217,971	44.4%	4,000,000	4,396,018	109.9%	
	No. of Tree Seedlings Planted	4,000,000	2,162,205	54.1%	3,750,000	4,146,570	111%	
	No. of Bamboo Seedlings Raised	0	No seed available		200,000	204,060	102.0%	Split tubes with more than 1 seedling
	No. of Bamboo Seedlings Planted	0			150,000	277,587	185%	
No. of HHS with Improved Stoves	3,000	8,326	277.5%	5,000	3,814	76.3%	Low result due to new TLC stove	
SUSTAINABLE LAND & WATER MANAGEMENT PRACTICES ADOPTED	No. of HHS Participating in CA	3,500	3,790	108.3%	9,000	5,792	64.4%	Data incomplete
	Area under CA - includes Agroforestry (ha)	1,400	1,386	99.0%	3,600	2,401	66.7%	Significant increase in crop yields under CA relative to Traditional Practice. The difference was largely related to the conservation of water in a season where rainfall was low/erratic
	Maize Yields under CA Pure Stand (kg)	4,500	5,524	122.7%	4,500	3,920	87.1%	
	Maize Yields under CA Intercrop (kg)	4,200	5,613	133.7%	4,200	4,043	96.3%	
	Maize Yields under Trad. Practice (kg)	3,750	4,402	117.4%	3,750	2,728	72.7%	
	Groundnut Yields under CA after Maize (kg)	NOT IMPLEMENTED			1,500	1,994	132.9%	
	Groundnut Yields under CA after Maize + Legume Intercrop (kg)				1,500	2,051	136.7%	
	Groundnut Yields under Traditional Mgt after Maize (kg)				1,200	1,276	106.3%	
	No. of Households with Fruit Trees	500	254	50.8%	250	65	26.0%	Limited planting material
	No. of HHS with Vetiver Grass as a S&WC practice	1,000	224	22.4%	300	193	64.3%	
No. of HHS with AF Species	1,000	2,269	226.9%	2,000	138	6.9%	New focus is to integrate AF with CA	
No. of HHS using Organic Manure	4,000	1,931	48.3%	2,000	4,029	201.5%	Heavy focus by Min of Agriculture	

Table 2: MACC: Targets & Results for 2010/11 and 2011/12 (page 2 of 2)

PERFORMANCE INDICATOR	MEASUREABLE INDICATORS OF PERFORMANCE	Baseline ¹	2010/11		2011-12			Comments
			Targets	Results	Targets	Results	% Achieved	
CROP DIVERSIFICATION AND IRRIGATION (Production and yields were under-reported and require separate household surveys)	Area under Kilombero Rice (ha)		400	481	400	529	132.3%	In line with targets
	Yield of Kilombero Rice (tons)		800	915	800	873	109.2%	
	Area under Sugar Beans (ha)		150	53	150	To be determined		Sugar beans are planted in May/June and harvested in Sep
	Yield of Sugar Beans (tons)		200	78	200			
	Area under Groundnuts, Soya Beans, Pigeon Peas (ha)		200	55	200	195	97.5%	In line with targets
	Yield of Groundnuts, Soya Beans, Pigeon Peas (tons)		300	44	300	284	94.7%	
	Area under Paprika / Bird's Eye Chillies (ha)		100	827	500	667	133.3%	Exceeded targets due to demand
	Yield of Paprika / Bird's Eye Chillies (tons)		80	508	300	128	42.7%	Marketing data ongoing
	Area under Cassava (ha)		100	34	50	18	36.0%	Limited planting material in 2011/12
	Yield of Cassava (tons)		2,000	402	1,000	To be determined		Harvests not yet done
	Area under Sweet Potato (ha)		Not Targeted in 2010/12 due limited planting material					No planting material
	Yield of Sweet Potato (ton)							
	Area under Irrigated Vegetables & Cereals (ha)		250	189	200	31	15.5%	Limited area due to lack of water in 2011/12; harvesting/marketing ongoing
	Yield of Irrigated Vegetables & Cereals (tons)		600	486	500	102	20.5%	
Livestock Production	No. of Households keeping improved Livestock		250	189	250	196	78.4%	Incomplete data on sales due to loss of Livestock Technician
	Animal Sales and Income (MK)		2,500,000	1,414,082	2,500,000	367,465	14.7%	
Chia Lagoon Fisheries	Quantity of Fish Catches in Chia Lagoon (Kg)		400,000	442,075	400,000	173,271	43.3%	Lower than normal fisher catch & income but prices/kg are higher. Lower catches could be due to improved fishery management to help restore productivity & sustainability
	Fisher Incomes from sales from Chia Lagoon (MK)		40,000,000	45,212,221	45,000,000	28,540,901	63.4%	
	Vendor incomes from Fish Sales at Chia Fish Market (MK)		10,000,000	10,691,737	10,000,000	14,260,595	142.6%	
PROGRAM IMPACTS MONITORED	Average Income per year		25%	Impact surveys to be undertaken & reported separately			Surveys to be outsourced and compared with baselines	
	% of Households Food Secure Year-round		20% / year					
	% Households Wood Secure ⁷		None in					
	Natural Resource Monitoring ⁸		NYD	NYD	TBD			

NOTES

NYD=Not Yet Determined; NA=Not Applicable

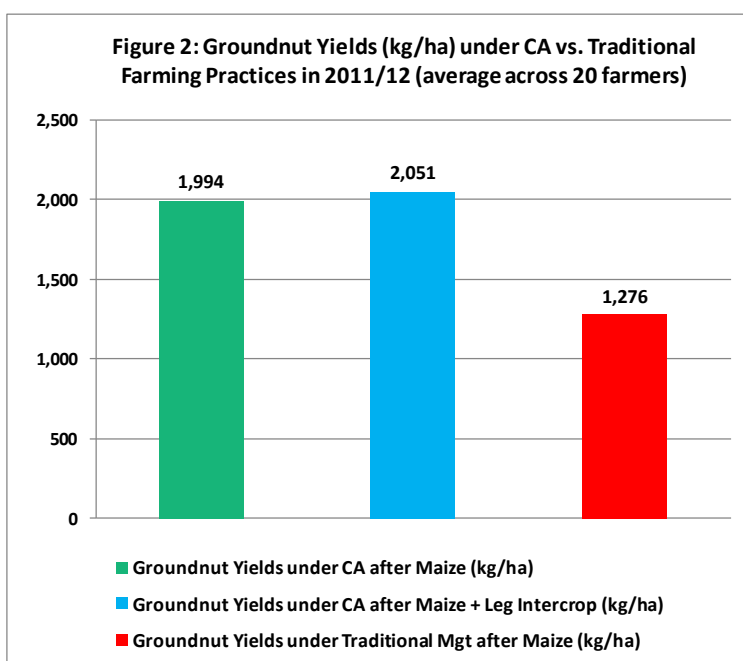
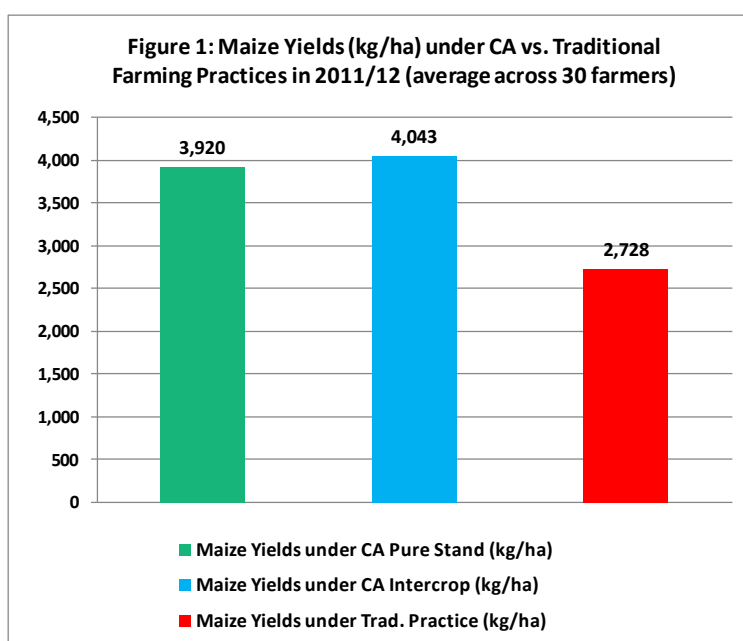
1. Baseline surveys was conducted and reported in 2009 so figures will be filled in after the analysis is complete.
2. Targets in subsequent years may change based on results, costs and response by communities.
3. Results will be specified in semi-annual and annual reports - January and June of each year.
4. Figures depend on resource assessment and mgt plan to identify products, sustainable harvest levels, prices & markets.
5. Targets on outputs & sales not yet established due to need for information on productivity, harvest levels, & markets
6. Targets on outputs & sales not yet established due to need for information on the nature & potential of tourist markets
7. There is a lag time of at least 3 years before planted trees are large to harvest wood
8. Not yet undertaken, but change from benchmark indicators will be monitored over the project's life time

Table 3: Forestry Interventions, August 2011-July 2012

Village Tree Planting	Results Across Sites
# Villages	1,172
# Households	20,724
# Male Participants	15,027
# Female Participants	12,966
# Nurseries	1,718
# Bamboo Seedlings Raised	204,060
# Tree Seedlings Raised	4,234,722
# Bamboo Seedlings Planted	277,587
# Trees Planted on Homesteads	899,493
# Trees Planted on Communal Lands	2,491,934
# Trees Planted on Farms	638,788
# Fruit Trees Planted	130
# Total Trees Out-Planted (all types)	4,030,345
School Tree Planting	
# Schools Participating	59
# School Nurseries	50
# Tree Seedlings Raised	161,296
# Trees Planted	123,917
Nat Regeneration (Village Forest Areas)	
# Villages	24
# Households	970
# Male Participants	502
# Female Participants	468
Total Area (ha)	50.5
Regenerating Trees (#)	75,750
Nat Regeneration (Individual Forest Areas)	
# Villages	29
# Households	48
# Male Participants	38
# Female Participants	14
Total Area (ha)	133.0
Regenerating Trees (#)	199,500
Nat Regeneration (School Forest Areas)	
# Schools	1
Total Area (ha)	7.1
Regenerating Trees (#)	10,650
Improved Kitchen Stoves (#)	
# Villages	261
# Households	3,814
# Female Participants	3,814

3.5 Sustainable Agricultural Practices

Table 4 shows results on conservation agriculture, agroforestry, use of organic manures and planting vetiver hedges along the contour to reduce runoff and erosion. The total number of households engaged in CA last season was 5939. Although more men signed for the input packs than women (68% vs. 22%), actual implementation of CA in the field by women was higher than men because they do the bulk of the farming and they benefit directly from the savings in labor and higher yields. CA deserves a special note because of its excellent performance during dry spells. In contrast, replanting is often needed after periods of drought under the traditional practice due to severe crop stress from lack of moisture. Differences in maize yields between CA and the traditional practice were higher than normal due to the dry spells experienced in the 2011/12 season. Maize yields in pure and intercropped stands under CA averaged 42% and 48% higher respectively than maize under traditional practices (see **Figure 1** below). Similarly, yields of groundnuts grown after maize in pure and intercropped stands under CA were 56% and 61% higher than under the traditional practice (see **Figure 2**).



To complement the benefits of CA, TLC is now integrating agroforestry, vetiver grass and organic manures on farmland under CA. Details are presented below.

CA is being recommended where *Faidherbia* trees are found naturally. Plots where CA was integrated with mature *Faidherbia* trees produce yields of 8 tons or more from the combined effects on soil fertility, weeds and the micro-environment. CA is also recommended on plots planted with young *Faidherbia* seedlings which survive and grow better due to reduced mortality caused by accidental hand weeding of the crop and dry season burning which is not used under CA. The results are providing a platform for smallholder farmers to reduce their vulnerability and risk to climate change through increased and more stable crop yields, lower inputs costs, and significant reductions in the loss of top soil and runoff. Substantial savings in labor also allow farmers to expand and diversify farming, culminating in food security and higher incomes. The bottom line is that farmer demands for CA outweigh available resources from the project, demonstrating the potential to scale up the program. Increase farmer demands are being addressed under the HEAL program, and is the reason behind 2 new TLC projects with 1) the Conservation Farming Unit (CFU) in Zambia funded by the Royal Norwegian Embassy in Lusaka, and 2) the DfID CA project.

The use of organic manures involved 4029 households with 27.5% participation by women, Households involved in planting vetiver hedges on the contour totaled 187 with 24.9% participation by women. Although participation by women appears low, in reality, it is much higher for the same reasons explained above with CA.

Table 4: Sustainable Agricultural Practices, August 2011- July 2012

Conservation Agriculture	Results Across Sites
# Villages	618
# Households	5,939
# CA Input Packs Delivered	7,647
# Males Receiving Input Packs	4,622
# Females Receiving Input Packs	1,281
Ha Under CA Maize Only	2,768
Ha Under CA with Grnuts, Soya, Tobacco or Cassava	86
Ha Under CA Any Crop + Grain Legume Intercrop	82
Ha Under CA Any Crop with Faidherbia	55
Ha Under CA Any Crop + Pigeon Peas or Tephrosia	11
Total Ha under CA (sum)	3,001
Organic Manures	
# Villages	522
# Households	4,029
# Male Participants	2,922
# Female Participants	1,107
# Ha under OM	426
Vetiver Grass	
# Villages	46
# Households	187
# Male Participants	145
# Female Participants	48
# Length of Hedgerows (m)	15,447
# Ha under Vetiver	34

3.6 Irrigation and Crop Diversification

Results on treadle pump irrigation and stream diversion are shown in **Table 5**, which reflect new farmers and sites for 2011/12. Total numbers were lower than expected. The main reason is that other NGOs have attracted farmer groups formed and trained by TLC by the lure of free equipment and inputs. Farmers cannot be blamed for choosing the option of free inputs. However, the programs of these NGOs are short term (some less than 12 months) with no training and extension support to build farmer capacity to sustain irrigation activities. With the departure of these NGO programs, many farmers are returning to TLC for support. Conflicting approaches of this nature are unfortunate but fairly common in many TLC sites.

As explained with other farming practices, the participation by women appears low since the men of the household typically sign for the irrigation equipment and inputs. This is a cultural issue that distorts the actual involvement of women in undertaking the practice.

Rice schemes rehabilitated by TLC, along with low cost irrigation systems with treadle pumps and stream diversion, are excellent examples of positive impacts to improve food security and incomes at the household level (see **Table 5**). Other forms of irrigation (treadle pumps and stream diversion) continue to have a major influence on improving food security and incomes of households which is creating a buffer against the threats and vulnerability of climate change and the high dependency on rain-fed crops.

Table 5: Irrigation Results, August 2011 - July 2012

Treadle Pump Irrigation	Results Across Sites
# Clubs/Villages	23
# Households	57
# T Pump Kits Delivered	57
# Males Receiving T Pump Packs	55
# Females Receiving T Pump Packs	2
Area Under Irrigation	25
Stream Diversion	
# Clubs/Villages	4
# Households	11
# Input Packs Delivered to Households	7
# Males Receiving Input Packs	6
# Females Receiving Input Packs	1
Area Under Irrigation	3
Rehabilitation of Irrigation Schemes ¹	
# Schemes under Rehabilitation	1
# Households	45
Area Under Irrigation	3

¹ No gender breakdown but entire HH is involved in rice schemes
12% of the people receiving inputs were women but this does not mean women were not actively involved in irrigation

Figures on crop diversification are presented in **Table 6**. The growing numbers of farmers (3927) demonstrate increased interest due to the positive impacts of the program. In contrast to the other programs, the % of women to men receiving seed was 48.8 to 51.2%.

Table 6: Crop Diversification, August 2011 - July 2012

Groundnuts, CG7 / Chalambana 2000	Results
Amt of Seed Given (kg)	2,410
# Clubs	29
# Villages	34
# Males Receiving Seed	238
# Females Receiving Seed	61
# Household Participants	299
Ha Planted	34
Beans	Results
Amt of Seed Given (kg)	515
# Clubs	4
# Villages	12
# Males Receiving Seed	31
# Females Receiving Seed	9
# Household Participants	40
Ha Planted	6.4
Soya Beans, Mixed	Results
Amt of Seed Given (kg)	6,358
# Clubs	17
# Villages	64
# Males Receiving Seed	192
# Females Receiving Seed	337
# Household Participants	529
Ha Planted	151
Pigeon Peas	Results
Amt of Seed Given (kg)	150
# Clubs	3
# Villages	8
# Males Receiving Seed	12
# Females Receiving Seed	18
# Household Participants	30
Ha Planted	10

Chillies	Results
Amount of seeds (kgs)	206
HHs participating	1,570
Area planted (ha)	599
Production (kgs)	83,239
Sales (kg)	74,561
Income (MK)	39,382,230
Average price (MK/kg)	528
Paprika	Results
Amount of seeds (kgs)	37
HHs participating	463
Area planted (ha)	67
Production (kgs)	44,799
Sales - not completed (kg)	8,635
Income (MK)	2,881,310
Average price (MK/kg)	334
Cassava, Manyokola	Results
# of Bundles Given (50 sticks)	1,380
# Clubs	42
# Villages	64
# Males Receiving Stick Bundles	322
# Females Receiving Stick Bundles	322
# Household Participants	644
Ha Planted	18
Rice, Kilombero	Results
Amt of Seed Reserved or Given (kg)	33,263
# Clubs	30
# Males Receiving Seed	174
# Females Receiving Seed	178
# Household Participants	352
Ha Planted	529

The % of women receiving crop seed was equitable with an average of 48.8% across all crops

3.7 Chia Lagoon Fisheries Management Association

The project continues to support the management of the Chia Lagoon Fisheries Association which comprises 12 BVCs with 831 fishers from 17 villages, and 73 fish vendors.

Fish catches by species from the Chia Lagoon are shown in **Table 7**. The total catch was 173,271 kg with an average income of MK 34,345 per fisher. These figures are down about 30-35% from the average over the last few years. This is believed to be a reflection of management efforts to create a balance with the fish population for sustainable fishing in the lagoon. Management initiatives include controls on types of fishing gear, a closed season for fishing nets, and protection of key breeding grounds.

Fish sales at the Chia Market are presented in **Table 8**. The figures show that the average vendor in the market earns an annual income of Mk 195,351 which is a 42% increase over last year. This demonstrates that fish vendors at the Chia Fish Market are making an excellent living from selling fish. The discrepancy with the fishers suggests that assistance should be provided to fishers to negotiate better prices for their fish.

Table 7: Chia Lagoon Fish Catches and Sales by Fishers, August 2011 - July 2012

Species	Average Price	Catch (MT)	Total Catch (kg)	Consumption (kg)	Total Sales (kg)	Total Income (MK)	Avg HH Income (MK)	Avg HH Income (\$)
Chambo	585	7	6,658	666	5,993	3,503,475	4,216	25
O/Tilapia	208	44	43,713	4,371	39,342	8,180,004	9,844	59
Kambuzi	93	14	14,057	1,406	12,652	1,178,699	1,418	8
Kampango	192	1	1,287	129	1,158	222,696	268	2
Mlamba	167	71	70,544	7,054	63,490	10,625,452	12,786	77
Utaka	230	1	1,320	132	1,188	273,112	329	2
Sanjika	274	1	1,127	113	1,014	277,922	334	2
Others	138	35	34,563	3,456	31,107	4,279,541	5,150	31
Total	183	173	173,271	17,327	155,944	28,540,901	34,345	206

Table 8: Fish Sales at Chia Fish Market, August 2011 - July 2012

Fish Type	Main Species	Price/Kg (MK)	Total Sales (Kg)	Total Sales (MK)	Average HHI (MK)	Average HHI (\$)
Fresh or Fridge-rated	Chambo	1,096	4,323	4,737,807	64,901	389
	Kampango	242	1,081	261,286	3,579	21
	Mlamba	62	230	14,171	194	1
	Others	979	2,612	2,555,729	35,010	210
Sub-Total		918	8,246	7,568,993	103,685	621
Dried	Chambo	-	-	-	-	-
	Kampango	-	-	-	-	-
	Mlamba	-	-	-	-	-
	Others	509	25	12,843	176	1
Sub-Total		509	25	12,843	176	1
Smoked	Chambo	983	3,573	3,511,870	48,108	288
	Kampango	726	602	437,100	5,988	36
	Mlamba	871	99	86,357	1,183	7
	Others	924	2,874	2,656,275	36,387	218
Sub-Total		936	7,148	6,691,602	91,666	549
Grand Totals		926	15,394	14,260,595	195,351	1,170

3.8 Livestock Production

Table 9 shows the numbers of livestock distributed to farmers for the period August 2011 to July 2012 but sales data are incomplete due to the loss of TLC's livestock specialist. All farmers received training on animal care and production, construction of suitable animal housing, and marketing. 34.1% of the beneficiaries were women. Despite the lack of data on sales, interviews with farmers clearly show that livestock is a good business.

3.9 Ecosystem Monitoring/Research & Development

Identification of systems, methodologies and resources to monitor key aspects of the ecosystem is being finalized for quantitative assessments of impacts and change over time. Capabilities needed to institute effective systems of monitoring will be the focus over the next 12 months. This will involve contracts for professional services. With the acquisition of satellite imagery spanning several years from the beginning of the project, TLC will be able to document changes in land cover and their related causes from changes in land use and population pressure.

Table 9: Livestock Production, August 2011-July 2012

Participation, Production & Sales	Goats, Boer Mix	Pigs, Tristar
# Clubs	3	3
# Males Receiving Animals	42	42
# Females Receiving Animals	27	19
# Total Recipients	69	61
# Club Members	15	20
# Male Animals Given	64	45
# Female Animals Given	99	53
# Young Given	8	0
# Offspring Produced	44	17
# Animals Sold	5	11
Income Received (MK)	27,300	164,000
Average Price/Animal (MK)	5,460	14,909
Average Income/Participant (MK)	396	2,689
Participation, Production & Sales	Chickens, Black Australops	Guinea Fowls
# Clubs	4	0
# Males Receiving Animals	39	8
# Females Receiving Animals	15	4
# Total Recipients	54	12
# Club Members	31	0
# Male Animals Given	16	8
# Female Animals Given	29	19
# Young Given	1,279	78
# Eggs Produced	4,154	82
# Eggs Sold	3,295	37
Income Received from Eggs (MK)	112,485	1,480
Average Price/Egg (MK)	34	40
# Birds Produced	136	0
# Birds Sold	66	0
Income Received for Birds (MK)	62,200	0
Average Price/Bird (MK)	942	0
Average Income/Participant (MK)	3,235	123

Note: Records on sales are incomplete due to the loss of TLC's Livestock Specialist

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