CIMMYT

Australian Government
Australian Centre for International Agricultural Research

Sustainable Intensification of maize-legume based Farming Systems for Food Security in Eastern and Southern Africa (SIMLESA)

Annual Report

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• Progress summary

Food security is a major concern in the east and southern Africa region. While the food crisis has receded somewhat at the international level, within the region urban food prices remain relatively high. Among the food crops, maize is the main staple and legumes an important dietary protein source for the rural poor. Legumes are widely used as an intercrop in maize systems, and are also significant source of income for women. Seasonal variability causes wide swings in food crop yields, including maize and legumes. Rain-fed maize-legume cropping systems show considerable promise in boosting productivity and helping reverse the decline in soil fertility that is a fundamental cause of low smallholder productivity in the region.

During July –December 2009 consultations between ACIAR and stakeholders in the region and Australia led to the formulation of the **Sustainable Intensification of maize-legume based Farming Systems for Food Security in Eastern and Southern Africa-SIMLESA** program proposal and its approval in March 2010. ACIAR is supporting the A$20 million program for 2010-2013 period which is being managed by the International Maize and Wheat Improvement Center. The program is implemented by NARS in Ethiopia, Kenya, Tanzania, Malawi and Mozambique in collaboration with many partners. The program aims at increasing farm-level food security and productivity, in the context of climate risk and change, through the development of more resilient, profitable and sustainable farming systems.

The five program objectives are:

- to characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing;
- to test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out;
- to increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data;
- to support the development of regional and local innovations systems; and
- capacity building to increase the efficiency of agricultural research today and in the future

Key features of SIMLESA

- SIMLESA will adopt an integrated production and value chain approach to the complex maize-legume farming systems. Participatory research and development with farmers, extension agencies, NGOs, Universities and agribusiness along the value chains will be coordinated through local innovation systems. Improved technologies, varieties and value chains innovations will be tested through on-farm research, demonstrations and pilot interventions in input and produce marketing chains. Through ASARECA and existing networks, the program will foster gender mainstreaming; strengthening an M&E framework in NARS and spill over's of improved crop systems management practices, knowledge and germplasm to other countries in the region.
- The direct benefits of SIMLESA will include improved maize and legume productivity by 30% and reduced downside yield risk by 30% on approximately African 500,000 small farms within ten years. Benefits to Australia will be concentrated in rain fed summer cropping systems in Queensland and northern New South Wales. Strategic capacity building in the five main participating countries involves short-term training and postgraduate fellowships supported by AusAID.
- SIMLESA oversight will be provided by a Steering Committee comprising high level representatives from partner organizations with two independent co-chairs from Africa and Australia. A Project Management Committee composed of CIMMYT senior management is constituted to give guidance to program implementation and management

Update and highlights: January-June 2010

Partnership and Linkages

- Excellent progress has been made notably in terms of workplans and agreements signed with all partners except ASARECA and ARC/South Africa (for whom it is agreed that activities would commence in year 2) and the start up of field activities in Kenya, Tanzania, Ethiopia and Queensland
- CIMMYT, as Commissioned Organization executes the program with the NARS of the five principal countries in collaboration with its regional and international partners namely; the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA), the International center for Research for the Semi-Arid Tropics (ICRISAT) and the Agricultural Research Council (ARC) of South Africa. Collaboration with the Department of Employment, Economic Development and Innovation Queensland and Murdoch.

- SIMLESA has established linkages with Drought Tolerant Maize for Africa (CIMMYT managed, BMGF funded) and with Tropical Legumes 2 (ICRISAT managed, BMGF funded) for the provision of advanced drought tolerant maize legume lines, respectively. Cooperation on national research teams and exchange of results with another project -N2Africa (Wageningen University, BMGF funded) have been discussed.
  - Local and national 'scaling out' linkages with agribusiness, extension and other large agricultural development programs are being identified (by a consultant) in order to foster local dissemination and adoption of technologies

- CIMMYT and partners has assigned staff to SIMLESA; and CIMMYT has already recruited the soil scientist/systems agronomist for southern Africa and an agricultural economist/Value Chain analyst who started working as of 1 July.
- SIMLESA national planning workshops for the five NARS have been held and identified national research teams, workplans, and field research protocols for the 2010 season, and it was used as the basis for CIMMYT-NARI agreements and the transfer of funds..

- NARS partners in Ethiopia, Kenya and Tanzania have planted CA on-farm exploratory and PVS trials in two and one each of the selected maize-based farming systems, respectively. The planting season for Malawi and Mozambique is November-December and field experiments are at the planning stage. Discussions with farmers, stakeholders on site selection and community surveys are in progress while baseline surveys are planned for August –October 2010 period.

- Eight SIMLESA NARS scientists have has been identified for possible AUSAID and ACIAR PhD scholarships to commence in 2011. Regional CA training schedules have also been developed.

- Communication materials: a SIMLESA poster, brouchers and brief/flyers have been prepared.

Achievements against Activities, Outputs and Milestones

2.1 Socio economics, Markets and Value chains: Objective 01

According to the log frame and agreed work plans only Output 1.1 **Initial characterization of ten maize-legume farming systems and selection of thirty research sites/communities** (Activities1.1.1 Exploratory visits to the target areas, selection of sites and community surveys within target countries was planed for implementation during the April-June 2010 period.

Ethiopia: SIMLESA Ethiopia Team planned 10 but selected **12 research communities** in the subhumid Bako and the Central Rift Valley farming systems. Secondary data collection is in progress (only about 50% completed). Exploratory CA and maize and legumes Participatory Varity Selection (PVS) trials are planted in the selected communities.

Kenya: In Western Kenya of Kakamega total of 14 farms in one community were selected. Due to delays in project start up and the earliness of the season filed activities started late hence only one community instead of four from two sub systems was selected. In Central Kenya of Embu selection of both project and control sites in three study districts of Embu East, Meru South and Imenti South were accomplished in May, 2010 using ARCVIEW 3.2a mapping software and a follow up visits to the selected sites by SIMLESA team members. Community surveys were then conducted in seven sub-locations distributed in the maize/beans and maize/pigeon peas farming system zones to obtain the first approximation of the socio-economic profile of farmers' assessment.

Tanzania Team members have been involved in site selections, farming system characterization and collection of secondary data on the selected research communities and the farming systems. In Karartu 11 farmers in two communities were identified where CA exploratory trials and one participatory maize variety selection is being conducted. As in some Western Kenya we missed the season and field activities were not implemented in the Mbulu district and in the eastern Zone of Ilonga farming system .

Malawi Community visits for site selections were conducted in all six selected districts. In each district, one Extension Planning Area (EPA) was identified where SIMLESA activities will be implemented. Amongst EPA's selected were Mtunthama EPA in Kasungu district, Kapiri EPA in Mchinji district, Golomoti EPA in Dedza district, Nsipe EPA in Ntcheu district, Mpilisi EPA in Balaka district and Mitundu EPA in Lilongwe district.
Characterization of villages in selected district EPA's for identifying agribusiness and market opportunities was also conducted.

The economist in the team and partners from Bunnda College had a discussion on how to organize objective 1 activities, particularly the exploratory surveys and agri-business studies indicated on the log frame

Mozambique. SIMLESA Team has developed a schedule to start the field work in July and August. Both survey instruments that incorporated comments from partners are finalized. Draft survey protocol and guideline are also completed and will be shared with partners soon. Background work to initiative both surveys and discussions with stakeholders on site selection are in progress. Both surveys will be launched August –October 2010 period.

2. Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

Highlights:

Objective 02 Field Exploratory trials :Systems agronomy-CA,

- Field experiments and demos have been established in one farming system each in Tanzania and in Kenya. SIMLESA Agronomist (Fred Kanampiu and the Coordinator visited Kagamega and Arusha the Northern Zone ,Ilonga in Eastern Zone of Tanzania in April.
- The coordinator and the Ethiopia national SIMLEA leader visited Bako, Melakssa and Awssa research sites. The Ethiopian NARS partners have planted trials in Bako subhumid farming systems zone plus in the Central Rift valley Awssa zone.
- The SIMLESA agronomist, Outside Linkage, Scaling out consultant and the SIMLESA Coordinator visited the research sites and had useful discussions and interactions with the respective teams
- Dr. Fred Kananmpiu (SIMLESA Agronomist and George Mburtahi visited Embu zone in Central Kenya and Arusha in Tanzania the week of 21 June and 13 July.
- The following planning meetings are also scheduled
  The following CA planning meetings have been scheduled for:
  - 22-28 August 2010: Kenya NARS systems agronomy and CA workshop
  - 27 sept-02 Oct 2010: Tanzania
  - 11-16 October 2010: Ethiopia
  - 17-23 Oct 2010: Mozambique
  - 31 Oct-06 Nov 2010: Malawi NARS systems agronomy workshop

Below is the specific outputs and activities of objective 01 implemented by the three countries of Eastern Africa.

Ethiopia: **(see annex 1)**

Activity 2.1.1 Two maize varieties (Melkassa-2 & BH-543) and 6 legume varieties (Nasir, Awash-M elka, Dimtu, Awash -1, Cheri, and Tibe) with complementary management options t were identified for agronomic experiments

2.2.1 Initial innovation systems formed in each agro ecology and one platform organized by each center (Bako, Awassa & Melkassa) by September 2010

2.3.2 Define 5-6 farmer groups host households and fields for exploratory trials: A total of 45 farmers and households who can host the on farm CA and other agronomic trials were identified for both agro-ecologies of Ethiopia. This specific activity is about 100% completed

2.3.3 Initial soil samples and cropping history recorded in exploratory trials sites. Soil samples were taken from all experimental fields. Cropping history, land use systems and cropping history of the study areas were recorded during site selection and planting time (90% completed);

2.3.4. Exploratory trials established A total of 42 on-farm CA and maize-haricot bean/soya bean have been established on-farmers fields in both agro ecologies of Ethiopia

2.4.4 Establish researcher-managed trials. The researcher managed on station trials each with 8 treatments (CA, conventional, rotation and maize-pulse intercropping) are established at 3 centers (Bako, Melkassa and Awassa)

Kenya (Annex 2)

Embu

To address the food insecurity problems, field activities were established in semi-arid regions of eastern Kenya to identify options for sustainable intensification of maize-legume farming systems, from exploring conservation agriculture (CA) principles. The studies were participatory, implemented by partners who were identified and the project objectives discussed with them. Four trial sites, two in the main maize/beans and the same number in the maize/pigeon-pea zones were selected and six farmers per site identified and sensitized to host the on-farm exploratory trials. Two researcher managed trial sites (one per zone) were identified and one of them in maize/beans zone fenced off and terraced to control grazing and soil erosion. Soil samples were collected from the sites/farms and were partially analyzed to determine the initial farm/site soil conditions.

Kakamega:

Validation trial was planted in mid March, 2010 in Siaya district, western Kenya. Participating farmers were members of Liganwa women's group. A total of 14 farms were established (13 belonged to members of the women's group while one farm was established within Agricultural Training Centre (ATC, Siaya). There were two sets of validation trials:

Type 1: testing of various soil organic matter (SOM) improvement options by employing conservation agriculture methodology, and

Type 2: testing of various maize varieties/germplasms for suitability in the region using "Mother-Baby" methodology. Treatments for Type 1 trial were:

1. Conventional practice: farmer's tillage practice, no herbicide used, stover not retained, maize intercropped with either common beans or soya beans,
2. Conservation agriculture: minimum tillage practice, herbicide used, stover retained, maize intercropped with either common beans or soya beans,
3. Conservation agriculture: minimum tillage practice, herbicide used, stover retained, maize intercropped with either rhizobia inoculated common beans or rhizobia inoculated soya beans,

4. Conservation agriculture: minimum tillage practice, herbicide used, stover retained, maize intercropped with desmodium and either common beans or soya beans,

Type 1 trial was undertaken by seven farmers and the ATC. Maize H513 was used in all treatments.

Type 2 trial was undertaken by another set of seven farmers and tested five maize varieties: H513, WH505, PH1, PH4 and DH04. Each variety was planted both as sole crop and as intercrop with either common beans or soyabeans.

In both trials, each experimental unit measured 17m x 15m. Maize was planted at a spacing of 75cm x 25 cm, one plant per station. Beans (variety KK 8) and soya beans (variety SB 25) were planted at a spacing of 75 cm x 20 cm, two plants per station. One row of desmodium (cv. green leaf) was drilled between maize and beans (or soya) rows. Fertilizer was applied to maize at the rate of 57 kg P and 80 kg N per ha at the time of planting and top-dressing, respectively. Glyphosate was sprayed immediately after sowing. Confidor solution was poured into ant-hills to kill ants. Two rain gauges were installed in two farms for rainfall data collection. Resource Project Kenya (NGO) will take active role in dissemination. Data already collected for crop modeling include rainfall at the site for the last three months. Maximum/minimum temperatures and radiation for the last 30 years have been obtained from Meteorological Weather Station located within KARI-Kakamega. Soil sampling has been done two times from three layers (0-15 cm, 15-30cm and 30-60cm) on seven farms undertaking Type 1 trials. Soils are being analyzed for N, P, K, organic carbon and pH. Soil bulk density, gravimetric soil water percentage, plant tissue for nutrient analysis and farming history data are being collected. APSIM will be employed for crop modeling and simulation.

Tanzania (Annex 3)

Activity 2.1.1: Potential technologies listed: Northern zone: Maize-Pigenpea intercropping. Maize variety Vumilia and pigeon pea variety Mali under CA and conventional methods.

Eastern zone: Maize-Pigenpea intercropping. Maize variety Staha, TMV1 and Bora. Pigeonpea variety Mali and Tumia under CA technology of rotating pigeon and conventional practice.

Northern zone: Certified seeds for newly released maize variety (Vumilia K1) was not sufficient, instead SC 627 was used only for this season, Vumilia K1 will be used next season.

2.2.1. Identification of Innovation Systems: Innovation system members formed in Karatu and Mbulu Districts. The activity has not started in the Eastern zone

2.2.2. Regular discussions and field visits conducted with program partners and members of the innovation system: One discussion meeting conducted on farm

2.3.2 Farmer groups and 5-6 host households and fields for multi-year exploratory trials defined by farmers within each target community. In Karatu11 farmers in two communities have been identified. Since the cropping calendar starts in Dec. – Jan, farmers have not yet been identified in Mbulu district

2.3. 3 Minimum data set for field characterization defined and sites characterized: Soil, topography and cropping history data collected in Karatu and Mbulu Districts

2.3.4. Exploratory trials with at least two CA options compared to one conventionally tilled : Exploratory trials established in 11 farmers field Karatu. Only one CA option was appropriate for the selected communities.

2.3.5. Participatory evaluation of exploratory trials by farmer groups and members of the innovation platforms: One participatory evaluation conducted

2.4.4 Researcher-managed trials established under conditions representative of the agro-ecologies: Two researcher managed trials at Selian and Karatu initiated

Objective 3: To increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

Ethiopia **(See Annex 1)**

3.1.1 Identification of pre-release or newly released hybrids and OPVs: Five varieties per farming system with potential suitability for the targeted farming system identified for pre-release in the target areas and planted for farmers' participatory variety selection (PVS). This activity is100% completed

3.1.2 Potential legume species and varieties for the target environment in the program countries analysed with TL II partners: Six potential legume species and varieties identified for PVS and intercropping compatibility with maize (60% completed)

3.1.3 Seed increase of pre-release and newly released maize hybrids and OPVs and legume species: Seeds of pre-release and newly released 12 maize hybrids and OPVs and 12 legume species and varieties with potential suitability for the targeted farming system are being increased at Awassa, Bako and Melkassa Research Centers (50% completed)

3.1.4 Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species: 10 Maize hybrids and OPVs and 8 legume varieties of different species suitable for the targeted farming system were identified and planted on-farmers field in each farming system

3.2.1 Seed increase of elite inbred lines and legume varieties generated in various programs: A total of 200 maize inbred lines and 80 legume genotypes were planted for seed increase at different centers (about 85% of the plan accomplished)

Kenya (See annex2)

Embu: The Team at Embu have not planted any trails or demos because the season and are planning for the September –October period

3.1.1 Identified pre-released or newly released hybrids and OPVs (KH500Q, KH500-21, Hybrid 208, 209, KDV 1 and Embu Synthetic suitable for the maize/bean and maize/pigeon pea cropping systems.Planted for seed increase inbred lines of KH 500Q under the supervision of KEPHIS

3.1.2 Identified potential legume species and varieties (beans; Embean-14 and Embean-7) and (pigeon-peas; KARI Mbaazi-2, ICEAP 00554 and ICEAP 00557).

Kakamega . Farmer participatory evaluation of pre-release and newly released maize hybrids under farmer representative and legume intercrop within CA conditions .Maize hybrids and legume (beans and soya beans) varieties suitable for the targeted farming system identified Scientists and extension officers took.

Generate widespread awareness among farmers about new maize, beans and soya bean varieties and management options part. 7 validation plots are established

Tanzania (see annex3)

3.1.1 In Northern Zone 5 hybrids and 6 Composites planted for evaluation and seven pre-released maize varieties identified.

3.1.2 Potential legume species and varieties for the target environment in the program countries analysed with TL II partners. Pigeon pea variety Mali identified

3.1.3 Seed increase of pre-release and newly released maize hybrids and OPVs and legume species: Breeder seed for maize variety "vumilia" produced. Mother lines of two hybrids Selian H 208, Selian H 308 produced

3.1.4 Mother Trials: Mother trials established in Karatu district

3.1.4 Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species and varieties under farmer-representative and legume-intercrop/CA conditions : Pre-released and newly released maize hybrids and OPVs legume species are in the field for farmer-participatory evaluation

4. Regional Institutional Innovation Objective 04

ASARECA and SIMLESA held a joint meeting to discuss the roles and responsibilities of ASARECA in the project. It is expected that ASARECA will incorporate the SIMLESA Objective 04 activities into its work .plan and re-align budgets and personnel costs as indicated in the program document. Discussions to finalize the modalities are still underway.

5. Capacity Building - Objective 05

Capacity building activities/regional training -NARS systems agronomy and CA workshop are scheduled for

- 22-28 August 2010: Kenya
- 27 sept-02 Oct 2010: Tanzania
- 11-16 October 2010: Ethiopia
- 17-23 Oct 2010: Mozambique
- 31 Oct-06 Nov 2010: Malawi

Daniel Rodriguez in working on the Regional APSIM modelling course

- Eight NARS scientists from Ethiopia, Kenya, Tanzania and Malawi have submitted applications for PhD fellowships under ACIAR and Australian Development Scholarships and selection of candidates for these very competitive awards is underway.

6. Linkages and Partnerships

- Local and national 'scaling out' linkages with agribusiness, extension and other large agricultural development programs are being identified by ACAIAR part time consultant (George Mburathi) in order to foster local dissemination and adoption of technologies and institutional varieties which will be identified during the first year.

- External 'research linkages' are being identified on key topics, e.g., livestock, post-harvest, weather insurance. SIMLESA and ACIAR have drafted a communications strategy which will be finalized after the whole-of-government strategy has been drafted
- SIMLESA is invited and will be represented at the FARA Annual General Assembly meeting 18-25 July 2010 in Ouagadougou.

Active consultations are being pursued with the following regional sister R&D programs in order to identify active collaborative linkages, as follows:

- Partnership program (AusAID). It is expected that at least four Ph D students will undertake field research with SIMLESA. SIMLESA is facilitating the identification of candidates to commence early 2011. Short training courses are under consideration.
- Food security in West Africa through CORAF (CSIRO managed, AusAID funded). CSIRO invited two NARS scientists to attend the CORAF workshop in Senegal during April (unfortunately travel arrangements could not be finalized on time).
  - A joint ACIAR-CSIRO-AusAID farming systems innovations workshop is being planned for early 2011. Observers will be invited to program annual meetings. Opportunities for joint training will be explored.
  - Drought Tolerant Maize for Africa (CIMMYT managed, BMGF funded). Provision of advanced drought tolerant maize lines.
  - Tropical Legumes 2 (ICRISAT managed, BMGF funded). Provision of advanced legume lines.
  - N2Africa (Wageningen University, BMGF funded). Cooperation on national research teams and exchange of results.
  - The potential for further cost-effective linkages will be explored with other complementary

Ethiopia - Annex 1.

Achievements against Activities, Outputs and Milestones: Summary table, 30 June 2010 EIAR

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 1.1	**Initial characterization of ten maize-legume farming systems and selection of thirty research sites/communities**					
Activity 1.1.1	Exploratory visits to the target areas, selection of sites and community surveys within target countries	Program communities and sites selected and adjoining control or counterfactual villages identified First approximation of socioeconomic profile of the communities within each target zone developed to identify and target hot spots	Target sites and villages selected by June 2010	Dr. Adam, Muluken and Getachew	Eth: all sites (approx 12 research community) selected, secondary data collection in progress (only about 50% completed),	Late receipt of allocated budget Survey protocol not received on time
Activity 1.1.2	Consultation and rapid appraisals for identifying agribusiness and market opportunities in maize-legume systems	Indicative opportunities for agribusiness and market development in maize-legume systems identified	Agribusiness opportunities identified in selected markets by August 2010	Lead: NARS economists and scientists from 5 countries: Partners: CIMMYT,	Eth: planned Ken: planned	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
				ICRISAT and Australian partners, market orientated NGOs and relevant private sector associations	Mal: in progress (10%) Moz: planned Tan: planned ESA: n/a	
Activity 1.1.3	Collection and analysis of secondary data (including any existing farm budget data) and mapping and characterization of the target farming systems in each country	GIS maps and socioeconomic and biophysical area profiles developed for selected farming systems	About Dec 2010 for data collection May 2011 for mapping of the results	NARS economists and scientists from 5 countries (leaders) for data collection CIMMYT (leader) for data analysis with support from Australian partners, NARS and ICRISAT QDEEDI (leader) for spatial characterizatio n and GIS mapping	Not started	
Output 1.2	**Understanding farmers' maize and legume production constraints and opportunities, crop and livestock interactions, resource use, technology preferences and**					

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
	market access in the ten farming systems					
Activity 1.2.1	Developing standardized instruments and survey tools through consultation with program teams	Instruments, tools and protocols for survey data collection standardized for all participating countries	Aug 2010	CIMMYT(leader), NARS and Australia, and ICRISAT	ESA: Partially achieved (80%) Instruments. tools and protocols developed and being shared with partners.	
Activity 1.2.2	Identification and training of enumerators, and implementation of farm household surveys	Villages and household types identified through household surveys and participating farmers & collaborators engaged Household data coded and entered into SPSS software for analysis	Surveys completed in 3 countries by Feb 2011 Surveys completed in 2 countries by August 2011	NARS (leaders) for supervision and implementing surveys, CIMMYT, Australia, and ICRISAT	Not started	
Activity 1.2.3	Villages and household types identified through household surveys and participating farmers engaged (in collaboration with 1.2.2)	Farm case studies identified and current farmer's decision on resource allocation and their consequences quantified in terms of productivity – risk – environmental consequences	June 2010	Lead: QDEEDI; Participate: ICRISAT; National Program staff[1]; CIMMYT; farmer and women's groups in the target communities	Not started	
Activity 1.2.4	Participatory diagnosis of rain fed maize and maize-legume systems	Improved understanding of the viability of rainfed maize-	December 2010	Lead: QDEEDI; Participate: participating	Not started	

[1] *In all cases, national programme staff include members of universities and graduate students*

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
	options in Queensland, Australia	legume systems in Queensland		farmers; NARES Link: CIMMYT		
Output 1.3	**Understanding maize and legume input and output markets and value chains including chain constraints and opportunities, costs and pricing patterns associated with the ten farming systems**					
Output 1.4	**Several farm-household system options identified which are risk reducing and productivity enhancing for each of the ten farming systems for testing in the research sites/communities**					
Output 1.5	**Effective adoption and impact pathways assessed for ten maize-legume systems**					
Activity 1.5.1	Adoption and impact assessments will be conducted through farm household surveys in selected farming systems to identify impact pathways and facilitate learning, change and priority setting processes.	Evaluation criteria, indicators and monitoring processes selected by the team Evaluation criteria and feedback processes implemented on changes in productivity, risk, income, at multiple scales (field, household,	Year 1-4 (2010-2013)	CIMMYT (leader, development of indicators/survey tools) with support from ASARECA and all partners, NARS in each country (monitoring and documenting	Political and security conditions will remain stable in all target countries to allow continuous monitoring of changes attributable to the interventions.	Reliable data that w build from the base household data to better understand adoption patterns a outcomes and refin interventions throu incremental learnin and change by the program team

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
		community/district , region, and country New opportunities identified from linkages with other programs and local, regional activities (e.g. new products, generation of inter- regional and inter- country spillovers)		change)		

Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 2.1	**Identified options for systems intensification and diversification, that reduce risk in the ten farming systems using systems modeling**					
Activity 2.1.1	A list of potential technology options analyzed	Lists of potential technologies prepared for the target farming systems / agro-ecosystems in each of the program countries.	February 2010 – Kenya and Tanzania; April 2010 – Ethiopia; September 2010 – Malawi and Mozambique	Lead: National program coordinators NARS biophysical and social scientists Participate CIMMYT Link: QDEEDI	Two maize varieties (Melkassa-2 & BH-543) and 6 legume varieties (Nasir, Awash-M elka, Dimtu, Awash -1, Cheri, and Tibe) with complementary mngt were identified for agronomic experiments	
Activity 2.1.2	Creating awareness with the farmers about technologies	Potential systems, practices and risk management strategies identified for the sustainable increase of maize system productivity and legume options for system diversification.	Feb/Mar 2010 – Kenya and Tanzania; April 2010 – Ethiopia; Sep/Oct 2010 – Malawi and Mozambique	Lead: National program coordinators Participate: CIMMYT Link: QDEEDI	Not started	Budget has been transferred late and hence, the activities have been started v late
Output 2.2	**Functioning local innovation systems developed in each of ten maize-legume farming systems to help overcome system limitations and enhance scaling out of technologies.**					

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Activity 2.2.1	Initiate innovation systems	Diverse set of potential innovation system members invited to participate in field visits and efforts to increase the productivity of maize-legume systems in each of the 10 agro-ecologies. Initial innovation systems formed in each agroecology	April 2010 – Kenya and Tanzania; June 2010 – Ethiopia; January 2011 – Malawi and Mozambique	Lead: National program biophysical and social scientists and extension agents; Participate: Agents from multiple institutions.	Not started	
Activity 2.2.2.	Innovation system members discussion groups on farm	At least one field visit with the innovation system members conducted during the crop season in each target maize-legume system and visiting at least half of the target communities. Post-harvest visit of the innovation system members to each target maize-legume system to discuss results, problems and limitations and measures to overcome them.	Mid crop season in each country starting in Kenya approximately May 2010. Approximately one month after harvest in each country	Lead: National program biophysical and social scientists and extension agents; Participate: Agents from multiple institutions.	Not started	

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 2.3	**Evaluated exploratory trials of current best options for maize/legume smallholder systems for different farm types in with 5-6 cooperating farmers in each of thirty research sites/communities**					
Activity 2.3.1	Community awareness meetings conducted in the target communities in each of the target ecologies in each country to discuss farmer defined production system problems, and options to overcome these. Linked to 1.1.1 and 1.1.2.	Community awareness meeting held in each target community informed by the results from Activity 1.2.	Staggered due to differences in planting dates. All awareness meetings held by October 2010, and recurrent during the life of the program.	Lead: National program biophysical and social scientists and extension agents; Participate: CIMMYT; Link: QDEEDI	Not started	The project was started later than th expected date in Ethiopia & since the beginning the researchers were b with site selection a trial planting
Activity 2.3.2	Define 5-6 farmer groups host households and fields for exploratory trials	Farmer groups, and 5-6 field sites established in each community	November 2010	Lead: National program biophysical and social scientists and extension agents; Participate: CIMMYT; and QDEEDI	A total of 45 farmers and households who can host the on farm CA and other agronomic trials were identified for both agro-ecologies of Ethiopia. This specific activity is about 100% completed	
Activity 2.3.3	Initial soil samples and cropping history recorded in exploratory trials sites.	Basic soil, climate, land use, topography and cropping history data available for each of the exploratory trial sites.	December 2011 after soil analyses conducted	Lead: National program scientists; National or regional soil laboratories; Participate: CIMMYT, and DEEDI	Soil samples were taken from all experimental fields. Cropping history, land use systems and cropping history of the study areas were recorded during site selection and planting time (90% completed);	

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Activity 2.3.4	Exploratory trials established	Exploratory trials established by farmers with program orientation and support. Conservation agriculture-based management systems adapted to the biophysical and socio-economic conditions of innovative farmers available in each of the targeted communities, contributing to the household livelihoods, increasing maize productivity and reducing climate risks.	January 2011 June 2013	Lead: National program scientists/extension personnel; local farmers and farmer groups.	A total of 42 on-farm CA and maize-haricot bean/soya bean have been established on-farmers fields in both agroecologies of Ethiopia	
Output 2.4	**Adjustments to the maize-legume systems tested in the exploratory trials and farmer experiments developed with farm and soil quality, system productivity and disease, pest and weed dynamics quantified**					

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Activity 2.4.4	Establish researcher-managed trials	One researcher managed trial established in each AEZs	May-Early July	NARS agronomist	The researcher managed on station trials each with 8 treatments (CA, conventional, rotation and maize-pulse intercropping) are established at 3 centers (Bako, Melkassa and Awassa)	
Output 2.7	**Farmer learning through annual facilitated visits of farmers and their local extension agents between the targeted communities in each of the five countries.**					
Activity 2.7.1	Identify communities with similar conditions to the target.	Communities with similar conditions to the target communities identified. At least one community in each agroecology.	December 2010 and annually thereafter	Lead: CIMMYT; Participate: QDEEDI; ICRISAT; National Program scientists	Not started	

Objective 3: To increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 3.1	**Ten to 15 stress tolerant maize varieties and 10 higher yielding legume varieties available to farmers in the selected farming systems through farmer- and seed company-participatory variety**	15 maize hybrids and 10 legume varieties adapted to farming systems released				

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
	evaluation and release					
Activity 3.1.1	Identification of pre-release or newly released hybrids and OPVs	Per farming system, identification of 4 pre-release (within NVMTs) or newly released hybrids and OPVs with potential suitability for the targeted farming system for use by Obj 2 and use in farmer-participatory evaluation (Obj 3)	Dec 2010	CIMMYT, NARS and seed company breeders	Five varieties per farming system with potential suitability for the targeted farming system identified for pre-release in the target areas and planted for farmers' participatory variety selection (PVS). This activity is100% completed	
Activity 3.1.2	Potential legume species and varieties for the target environment in the program countries analyzed with TL II partners.	Per farming system, 1-2 potential legume species and 2 varieties each for the target communities identified.	Dec 2010	ICRISAT in consultation with TL II partners, NARS	Six potential legume species and varieties identified for PVS and intercropping compatibility with maize (60% completed)	
Activity 3.1.3	Seed increase of pre-release and newly released maize hybrids and OPVs and legume species and varieties with potential suitability for the targeted farming system	Seed for farmer-participatory maize and legume variety evaluation	Dec 2010	NARS breeders, backstopped by CIMMYT	Seeds of pre-release and newly released 12 maize hybrids and OPVs and 12 legume species and varieties with potential suitability for the targeted farming system are being increased at Awassa, Bako and Melkassa Research Centers (50% completed)	
Activity 3.1.4	Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species and varieties under farmer-representative and legume-intercrop/CA	Maize hybrids and OPVs and legume varieties of different species suitable for the targeted farming system identified	Dec 2011	National breeders	10 Maize hybrids and OPVs and 8 legume varieties of different species suitable for the targeted farming system were identified and planted on-farmers field in each farming system	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
	conditions					
Activity 3.1.5	In parallel to farmer-participatory trials. seed production characteristics of elite maize hybrids and OPVs and legume varieties established	Per country, 3 producible maize hybrids and OPVs and 2 legume varieties suitable for the targeted farming system identified	Dec 2011	NARS breeders, backstopped by CIMMYT and TL II partners	Not planned for this year	
Activity 3.1.6	Improved GxExM analysis approaches applied to Regional Maize and Legume Variety Trials	Recommendation domains for OPVs and hybrids and legume species and varieties evaluated based on regional trials (which are executed by other program such as DTMA or TL-II)	Dec 2012	CIMMYT and ICRISAT breeder and agronomists	Not planned for this year	
Activity 3.1.7	Improved GxExM analysis approaches applied to Farmer participatory maize variety trials and NMVTs	Fast-tracked variety release in at least two member countries	Dec 2013	National breeders	Not planned for this year	
Activity 3.1.8	DUS and NMVT/VCU testing of selected maize OPVs and hybrids	Per country, 3 producible hybrids and OPVs released	Dec 2013	Variety release authorities	Not planned for this year	
Activity 3.1.9	Requirements for legume variety release completed for adapted varieties in each program country	At least one adapted legume variety released in each of the program countries.	Dec 2013	Variety release authorities	Not planned for this year	
Activity 3.1.10	Licensing of released hybrids and OPVs and if possible, legume	Per country, 3 producible hybrids and OPVs and at	Dec 2013	NARS legal advisors	Not planned for this year	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
	varieties, to seed companies	least one legume variety licensed to seed companies				
Activity 3.1.11	Breeder seed production for seed companies and demonstrations	Per country, 1 ton of breeder seed for each of 3 producible hybrids and OPVs produced, and at least 500kg of legume variety breeder seed.	Dec 2013	National breeders	Not planned for this year	
Output 3.2	**Regional nursery for further improved (2nd generation) maize and legume varieties and hybrids**					
Activity 3.2.1	Seed increase of elite inbred lines and legume varieties generated in various programs	Regional nursery (maize) or bi-directional exchange (legume)	Apr 2010 (Eastern Africa) Dec 2010 (Southern Africa)	CIMMYT and TL II breeders	A total of 200 maize inbred lines and 80 legume genotypes were planted for seed increase at different centers (about 85% of the plan accomplished)	
Activity 3.2.2	Testcrossing of maize inbreds	Testcross progeny	Feb 2011 (Eastern Africa) Dec 2010 (Southern Africa)	CIMMYT and QDEEDI breeder	Not planned for Ethiopia	
Activity 3.2.3	Joint characterization of elite inbreds and legume varieties	Elite inbred and legume variety characterization for priority stresses in target countries	Oct 2012 (Eastern Africa) May 2011 (Southern Africa)	NARS, CIMMYT, TL II partners and QDEEDII breeders (QDEEDII for maize)	Not planned for this year	
Activity 3.2.4	Joint characterization of elite testcrosses in relevant farming systems, including with legume intercropping	Testcross characterization in various legume systems	Oct 2011 (Eastern Africa) May 2011 (Southern Africa)	NARS & CIMMYT breeders, QDEEDII	Not planned for this year	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
3.2.5	Development of web platform including database for combination and effective exchange of germplasm information	Web-based access to regional germplasm characterization data and information	Dec 2012	CIMMYT	Not planned for Ethiopia	
Activity 3.2.6	Development and selection of new 2nd generation hybrids, OPVs and legume varieties based on joint germplasm characterization and predicted performance of hybrids/OPVs	Maize and legume varieties and hybrids with further improved adaptation to target farming systems, consideration of insights from household and value chain studies	Dec 2013	NARS, CIMMYT and TL II breeders	Not planned for this year	
Activity 3.2.7	Target farming system-related improvement of infrastructure for program execution	Irrigation for nurseries, contribution to cold room maintenance	Dec 2010	National breeders	Not started	
Activity 3.2.8	Assess opportunities for incorporating national germplasm into regional nursery	MoU for germplasm exchange established	Dec 2010	CIMMYT breeder and TL II Coordinator	Not planned	
Output 3.3	**Environmental characterization**					
Activity 3.3.1	Environmental characterization of main CIMMYT, NARS and Queensland testing sites	Environmental characterization of 16 strategic maize testing sites in Africa and Australia	Dec 2013	CIMMYT and QDEEDI	Not planned	

Objective 5: Capacity building to increase the efficiency of agricultural research today and in the future

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 5.1	**Training on technology targeting and value chain analysis provided to build and enhance capacity of national and regional programs**				Not started	

Annex 2. Kenya

Achievements against activities and outputs/milestones.

Kakamega

Objective 2. To develop, adapt and evaluate sustainable smallholder maize-legume farming systems that improve productivity and reduce risks.

No	Activity	Outputs/milestones	Completion date	Comments
2.1	Identification of options for intensification and diversification of maize-legume based farming systems that reduce risks and increase productivity	Conservation agriculture (CA) identified as the most appropriate for the region	February, 2010	Participating KARI researchers, Resource Project Kenya (NGO) and Project Coordinator from CIMMYT Nairobi took part.
2.2	Discussions held with participating farmers to evaluate technology and livelihood options	Potential systems, practices and risk management strategies identified for sustainable increase of maize system productivity and legume options for system diversification	February, 2010	PI and other participating scientists led the discussions
2.3	Community awareness meetings conducted in the target ecology	2 community awareness meetings held	March, 2010	Extension officers, Area Administrators took part
2..4	Fields for multi-year validation plots defined by farmers	7 fields established	Mid-March, 2010	Identification of fields and planting started late due to late arrival of funds
2..5	Researchers on the project in western and eastern Kenya, and members of innovation platform meet in Nairobi	Activities for both western and eastern sites harmonized and work-plan made	Mid-April,2010	

2..6	Minimum data set for field characterization defined and validation plots characterized	Basic crop, soil, climate, land use, and cropping history data for each demo plot available	Continuous	Dr Rodriques, Dr Wall and Country Coordinator assisted in defining minimum data set (through e-mails)
2..7	Training farmers on how to use rain-gauge	Rainfall data collected by participating farmers; farmers equipped with skills	Mid-April, 2010	Meteorological officer from Kakamega did the training
2..8	Participatory evaluation of validation plots by farmers' group and members of innovation platform conducted and documented at early and mid crop growth stages	Data available on qualitative and quantitative evaluations of validation plots by farmers and other members of the platform	Early and mid crop growth stages	Participating scientists and extension officers moderated the evaluations
2..9	Field-day for both participating and non participating farmers and other stakeholders	Data available on qualitative and quantitative evaluations of validation plots by farmers and other members of the platform; technology disseminated widely	Planned for mid-July, 2010	Resource Kenya Project (NGO) will take a leading role

Objective 3. To obtain adapted and stable maize and legume varieties for smallholder farmers through accelerated breeding, regional testing and release.

No.	Activity	Outputs/milestones	Completion date	Comments
3.1	Farmer participatory evaluation of pre-release and newly released maize hybrids under farmer representative and legume intercrop within CA conditions	Maize hybrids and legume (beans and soya beans) varieties suitable for the targeted farming system identified	March, 2010	Scientists and extension officers took part
3.2	Generate widespread awareness among farmers about new maize, beans and soya bean varieties and management options	7 validation plots established	March, 2010	Scientists, extension officers and local administration took part

2. ACHIEVEMENT AGAINST ACTIVITIES AND OUTPUTS/ MILESTONES : Embu

Objective 1.0:- Pathways to Sustainable Intensification of Maize-Legume based farming systems for food security in Eastern Kenya

Objective	Activity	Activity	Achievement
1	1.1.1	Exploratory visits to the target areas, selection of sites and conduct community surveys	• Used a review to identify and map-up 2 trial sites in the maize/beans (UM_3) and 2 in maize/pigeon peas (LM_3/LM_4) zones in Embu (now Embu East), Meru South and Imenti South districts. • 2 control sites were selected, 1 in each AEZ (Annex 1). • Group discussions were held with women and men to gather diverse views on cereal and legume crops grown, crop varieties

			and preferences, constraints, markets and farmer typologies (Annex 2

ii. ***Objective 2: To develop and scale out climate resilient (including drought resistant) and sustainable smallholder maize-legume farming systems that improve productivity and reduce farming risks***

Project Objective	Activity No.	Activity	Achievement
2	2.1.1	Identification of potential technology options to validate with partners	Four (4) potential technology options to test under on-farm and on-research trials identified and agreed upon by project partners (Annex 1).
2	2.3.4	Planning and preparation of exploratory trials and protocols	- The protocol for the study was prepared with consultation of CIMMYT agronomist and ACIAR modellers.
2	2.4.4	Planning of researcher managed trials for monitoring medium to long term effects of CA	. The following were achieved: - Identification of 2 sites in maize/beans and maize/pigeon-pea zones - Fencing off and terracing one of the (maize/beans) to control grazing and soil erosion. Soil sampling for determination of initial soil fertility status done.
2	2.1.2	Create farmers awareness on proposed trials and technologies to be used.	- Involvement of different partners in technology validation and promotion is emphasized by SIMLESA project. Potential partners and their strengths for contributions in the project were identified (Annex 2)
2	2.3.2	Define 5-6 farmer groups host households and fields for exploratory trials	- Four (4) sites identified - Six (6) trial farmers per site were identified and partially sensitized to host the trials
2	2.3.3	Conduct initial soil sampling and prepare farm profiles (history) for exploratory trial sites	- Two (2) soil samples taken (0=15cm) and (15 – 30cm) depths. Some soil analysis was done at KARI-Embu. - Farm profiles done to almost all farm in the 2 sites
2	2.3.4	Establish on-farm exploratory trials	- Approximately 0.04 ha per selected farm marked out for exploratory trials identified. - Soil sampled to determine initial soil fertility status (see activity 2.3.3). Some soil analysis was done at KARI-Embu.

Objective 3: To increase the range of maize varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data, and accelerate their use in combination with newly released legume varieties

Project Objective	Activity No.	Activity	Achievement
3	3.1.1	Identify 4 pre-released or newly released hybrids and OPVs	• Identified pre-released or newly released hybrids and OPVs (KH500Q, KH500-21, Hybrid 208, 209, KDV 1 and Embu Synthetic) suitable for the maize/bean and maize/pigeon pea cropping systems. • Planted for seed increase inbred lines of KH 500Q under the supervision of KEPHIS
3	3.1.2	Identify potential legume species and varieties	• Identified potential legume species and varieties (beans; Embean-14 and Embean-7) and (pigeon-peas; KARI Mbaazi-2, ICEAP 00554 and ICEAP 00557).

ANNEX 3 TANZANIA ***Achievements against Activities, Outputs and Milestones: Summary table, 30 June 2010***

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned activities July-December 2010
Output 1.1	**Initial characterization of ten maize-legume farming systems and selection of thirty research sites/communities**						
Activity 1.1.1	Exploratory visits to the target areas, selection of sites and community surveys within target countries	Program communities and sites selected and adjoining control or counterfactual villages identified First approximation of socioeconomic profile of the communities within each target zone developed to identify and target hot spots	Target sites and villages selected by June 2010	NARS economists and scientists from 5 countries (leaders), CIMMYT, ICRISAT and Australian partners	All sites selected	Transport is the main constraint	Continue collecting secondary data
Activi	Consultation and rapid	Indicative opportunities	Agribusiness	Lead: NARS economists			Identification of

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned activities July-December 2010
ty 1.1.2	appraisals for identifying agribusiness and market opportunities in maize-legume systems	for agribusiness and market development in maize-legume systems identified	opportunities identified in selected markets by August 2010	and scientists from 5 countries: Partners: CIMMYT, ICRISAT and Australian partners, market orientated NGOs and relevant private sector associations	Agribusiness opportunities in selected markets planned		Agribusiness opportunities in selected markets
Activity 1.1.3	Collection and analysis of secondary data (including any existing farm budget data) and mapping and characterization of the target farming systems in each country	GIS maps and socioeconomic and biophysical area profiles developed for selected farming systems	About Dec 2010 for data collection May 2011 for mapping of the results	NARS economists and scientists from 5 countries (leaders) for data collection CIMMYT (leader) for data analysis with support from Australian partners, NARS and ICRISAT QDEEDI (leader) for spatial characterization and GIS mapping	Secondary data collected		
Output 1.2	**Understanding farmers' maize and legume**						

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned activities July-December 2010
	production constraints and opportunities, crop and livestock interactions, resource use, technology preferences and market access in the ten farming systems						
Activity 1.2.1	Developing standardized instruments and survey tools through consultation with program teams	Instruments, tools and protocols for survey data collection standardized for all participating countries	Aug 2010	CIMMYT(leader), NARS and Australia, and ICRISAT	ESA: Partially achieved (80%) Instruments. tools and protocols developed and being shared with partners.		Instruments, tools and protocols for survey will be shared with partners
Activity 1.2.2	Identification and training of enumerators, and implementation of farm household surveys	Villages and household types identified through household surveys and participating farmers & collaborators engaged Household data coded and entered into SPSS software for analysis	Surveys completed in 3 countries by Feb 2011 Surveys completed in 2 countries by August 2011	NARS (leaders) for supervision and implementing surveys, CIMMYT, Australia, and ICRISAT	Not started		

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned activities July-December 2010
Activity 1.2.3	Villages and household types identified through household surveys and participating farmers engaged (in collaboration with 1.2.2)	Farm case studies identified and current farmer's decision on resource allocation and their consequences quantified in terms of productivity – risk – environmental consequences	June 2010	Lead: QDEEDI; Participate: ICRISAT; National Program staff[2]; CIMMYT; farmer and women's groups in the target communities	Not started		
Activity 1.2.4	Participatory diagnosis of rainfed maize and maize-legume systems options in Queensland, Australia	Improved understanding of the viability of rainfed maize-legume systems in Queensland	December 2010	Lead: QDEEDI; Participate: participating farmers; NARES Link: CIMMYT	Not started		
Output 1.5	**Effective adoption and impact pathways assessed for ten maize-legume systems**						
Activity 1.5.1	Adoption and impact assessments will be conducted through farm household surveys in selected farming systems to	Evaluation criteria, indicators and monitoring processes selected by the team Evaluation	Year 1-4 (2010-2013)	CIMMYT (leader, development of indicators/survey tools) with support from ASARECA and all partners,	Political and security conditions will remain stable in all target countries to allow continuous monitoring of changes attributable to the interventions.	Reliable data that will build from the baseline household data to better understand adoption patterns and	

[2] *In all cases, national programme staff include members of universities and graduate students*

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned activities July-December 2010
	identify impact pathways and facilitate learning, change and priority setting processes.	criteria and feedback processes implemented on changes in productivity, risk, income, at multiple scales (field, household, community/district, region, and country New opportunities identified from linkages with other programs and local, regional activities (e.g. new products, generation of inter- regional and inter-country spillovers)		NARS in each country (monitoring and documenting change)		outcomes and refine interventions through incremental learning and change by the program team	

Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Output 2.1	Identified options for systems intensification and diversification, that reduce risk in the ten farming systems using systems modeling						

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.1.1	A list of potential, sustainable, reduced risk yet more productive technology options that are compatible with present and/or future value chain arrangements in each of the target environments of the five program countries prepared based on ex ante analysis. In alignment with Objectives 1.1.1, 1.1.2 and 1.5.1 (value chains)	Lists of potential technologies prepared for the target farming systems / agro-ecosystems in each of the program countries.	April 2010	Lead: National program coordinators NARS biophysical and social scientists Participate CIMMYT Link: QDEEDI	Potential technologies listed: Northern zone: Maize-Pigenpea intercropping. Maize variety Vumilia and pigeonpea variety Mali under CA and conventional. Eastern zone: Maize-Pigenpea intercropping. Maize variety Staha, TMV1 and Bora. Pigeonpea variety Mali and Tumia under CA technology of ratooning pigeon and conventional	**Northern zone:** Certified seeds for newly released maize variety (Vumilia K1) was not sufficient, instead SC 627 was used only for this season, Vumilia K1 will be used next season. Eastern zone: Maize variety	Seed increase of Vumilia K1 using irrigation

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.1.2	Discussions held with participating farming communities, national technical staff (research and extension), and other members of the incipient innovation platforms, to evaluate technology and livelihood options (including those developed in 2.1.2) and determine the technologies to be tested on farm in each of the targeted communities.	Potential systems, practices and risk management strategies identified for the sustainable increase of maize system productivity and legume options for system diversification.	June 2010	Lead: National program coordinators Participate: CIMMYT Link: QDEEDI	Potential systems identified	In depth discussions on risk management and legume options has not been done since this was a very busy time for farmers to participate	Further discussions will be conducted
Output 2.2	**Functioning local innovation systems developed in each of ten maize-legume farming systems to help overcome system limitations and enhance scaling out of technologies.**						

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.2.1	Based on observations of problems in field plots and in maize, legume and CA value chains, multiple agents whose expertise and networks may be useful to overcome these problems invited to participate in local innovation systems (linked to Activity 2.3.5) and membership expanded as necessary	Diverse set of potential innovation system members invited to participate in field visits and efforts to increase the productivity of maize-legume systems in each of the 10 agro-ecologies. Initial innovation systems formed in each agroecology	June 2010	Lead: National program biophysical and social scientists and extension agents; Participate: Agents from multiple institutions.	Innovation system members formed in Karatu and Mbulu Districts. The activity has not started in the Eastern zone	Previous activities were carried forward due to late disbursement of funds	At least two discussion sessions will be held with innovation system members

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.2.2.	Regular discussions and field visits conducted with program partners and members of the innovation system in each agro-ecological zone to observe and discuss problems and bottle-necks with farmers	At least one field visit with the innovation system members conducted during the crop season in each target maize-legume system and visiting at least half of the target communities. Post-harvest visit of the innovation system members to each target maize-legume system to discuss results, problems and limitations and measures to overcome them.	Mid crop season July 2010. Approximately one month after harvest in each country	Lead: National program biophysical and social scientists and extension agents; Participate: Agents from multiple institutions.	One discussion meeting conducted onfarm		Planned to be conducted early July 2010 Planned for September 2010

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.2.3	Information flow between all members of the innovation system (including farmers) encouraged and facilitated	Telephone and/or e-mail network established between members of each local innovation system. Electronic newsletter initiated and circulated to all members of both of the local innovation systems in each country at least twice per year	Dec 2010	Lead: National program biophysical and social scientists and extension agents; Participate: Agents from multiple institutions.	Network established but electronic newsletter has not been initiated	Internet connections are not satisfactory	Internet and other options for information flow will be explored
Output 2.3	**Evaluated exploratory trials of current best options for maize/legume smallholder systems for different farm types in with 5-6 cooperating farmers in each of thirty research sites/communities**						

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.3.1	Community awareness meetings conducted in the target communities in each of the target ecologies in each country to discuss farmer defined production system problems, and options to overcome these. Linked to 1.1.1 and 1.1.2.	Community awareness meeting held in each target community informed by the results from Activity 1.2.	Staggered due to differences in planting dates. All awareness meetings held by October 2010, and recurrent during the life of the program.	Lead: National program biophysical and social scientists and extension agents; Participate: CIMMYT; Link: QDEEDI	Not done	Activity 1.2 has not been done yet	Community awareness meetings will be held after maize harvest
Activity 2.3.2	Farmer groups and 5-6 host households and fields for multi-year exploratory trials defined by farmers within each target community.	Farmer groups, and 5-6 field sites established in each community	November 2010	Lead: National program biophysical and social scientists and extension agents; Participate: CIMMYT; and QDEEDI	11 farmers in two communities identified	Not identified in Mbulu district since their cropping calendar starts in Dec. – Jan. while the project was initiated end of Feb.	The remaining communities will be identified before Dec 2010 Farmer group formation will be conducted

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.3.3	Minimum data set for field characterization defined and sites characterized	Basic soil, climate, land use, topography and cropping history data available for each of the exploratoty trial sites.	December 2011 after soil analyses conducted	Lead: National program scientists; National or regional soil laboratories; Participate: CIMMYT, and DEEDI	Soil, topography and cropping history data collected in Karatu and Mbulu Districts	Rainfall data not taken since rain gauges were not yet available	Make a follow-up with CIMMYT to avail the instruments for the following cropping season
Activity 2.3.4	Exploratory trials with at least two CA options compared to one conventionally tilled check established on each of 5-6 farms in each target community	Exploratory trials established by farmers with program orientation and support.	January 2011	Lead: National program scientists/extension personnel; local farmers and farmer groups.	Exploratory trials established in 11 farmers field Karatu	Only one CA option was appropriate for the selected communities	Data collection and compilation for annual reporting
Activity 2.3.5	Participatory evaluation of exploratory trials by farmer groups and members of the innovation platforms conducted and documented at the beginning, middle, end and after harvest each season (linked to Activity 2.2.1)	Data available on qualitative and quantitative evaluations of exploratory trials by farmers and other members of the local innovation platforms	Seasonal. First complete results by August 2011, and annually after that.	Lead: National program scientists; Participate: CIMMYT	One participatory evaluation conducted	The first participatory evaluation not conducted due to late disbursement of funds and transportation problems	Two participatory evaluations will be conducted

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Output 2.4	Adjustments to the maize-legume systems tested in the exploratory trials and farmer experiments developed with farm and soil quality, system productivity and disease, pest and weed dynamics quantified						

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?), cancelled;	Comments (implementation constraints	Planned July-December 2010
Activity 2.4.4	Researcher-managed trials established under conditions representative of the agro-ecologies addressed in the program to monitor the medium to long-term effects of the principal program interventions on soil quality and disease, pest and weed dynamics.	Two researcher managed trial established in each agroecology. Precise data on crop productivity and water dynamics available for crop/soil simulation model validation. Data available on the effects and potential effects of the principal technological interventions addressed by the program on soil quality, BNF, and disease, pest and weed dynamics.	December 2010 July 2011 and annually after that. July 2012 and annually after that	CIMMYT; NARS Scientists; QDEEDI; Murdoch Uni.	Two researcher managed trials at Selian and Karatu initiated	Precise data will not be available during the 2010 cropping season because the protocol for executing the trial was not clear from the beginning	Continue with data collection

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned July-December 2010
Output 2.7	**Farmer learning through annual facilitated visits of farmers and their local extension agents between the targeted communities in each of the five countries.**						
Activity 2.7.1	Communities with similar biophysical and socio-economic conditions to the target communities identified through site-similarity analysis based on the outputs from 1.1, 1.2, 1.3, 1.4, and 1.7	Communities with similar conditions to the target communities identified. At least one community in each agroecology.	December 2010 and annually thereafter	Lead: CIMMYT; Participate: QDEEDI; ICRISAT; National Program scientists	Not - done	Standardized instruments and survey tools are not ready	Communities with similar conditions will be identified

Objective 3: To increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned July-December 20

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned July-December 20
Output 3.1	**Ten to 15 stress tolerant maize varieties and 10 higher yielding legume varieties available to farmers in the selected farming systems through farmer- and seed company-participatory variety evaluation and release**	15 maize hybrids and 10 legume varieties adapted to farming systems released			5 hybrids and 6 Composites planted for evaluation in the northern zone		
Activity 3.1.1	Data analysis workshop linked to first in-country planning meeting	Per farming system, identification of 4 pre-release (within NVMTs) or newly released hybrids and OPVs with potential suitability for the targeted farming system for use by Obj 2 and use in farmer-participatory evaluation (Obj 3)	Dec 2010	CIMMYT, NARS and seed company breeders	Seven pre-released maize varieties identified	Varieties still in the field	Harvesting and data analysis
Activity 3.1.2	Potential legume species and varieties for the target environment in the program	Per farming system, 1-2 potential legume species and 2 varieties each for the	Dec 2010	ICRISAT in consultation with TL II partners, NARS	Pigeon pea variety Mali identified	Pigeon pea variety ICEAP 00053 is in the pipeline to be released	Seed increase of the two varieties

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned July-December 20
	countries analyzed with TL II partners.	target communities identified.					
Activity 3.1.3	Seed increase of pre-release and newly released maize hybrids and OPVs and legume species and varieties with potential suitability for the targeted farming system	Seed for farmer-participatory maize and legume variety evaluation	Dec 2010	NARS breeders, backstopped by CIMMYT	Breeder seed for maize variety "vumilia" produced Mother lines of two hybrids Selian H 208, Selian H 308 produced		Certified seed production for maize (Vumilia K1) Single cross and three way hybrids will be produced
3.1.4 i)	Plant mother Trial	Mother trials established	April, 2010	NARS	Mother trials established in Karatu district	Mother trials not planted under CA in the northern zone since the protocol was not clear from the beginning.	Data collection analysis and reporting
3.1.4 ii)	Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species and varieties under farmer-representative and legume-intercrop/CA conditions	Maize hybrids and OPVs and legume varieties of different species suitable for the targeted farming system identified	Dec 2011	National breeders	Pre-released and newly released maize hybrids and OPVs legume species are in the field for farmer-participatory evaluation		
Output 3.2	**Regional nursery for further improved (2nd generation)**						

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints	Planned July-December 20
	maize and legume varieties and hybrids						
Activity 3.2.7	Target farming system-related improvement of infrastructure for program execution	Irrigation for nurseries, contribution to cold room maintenance	Dec 2010	National breeders	Underground pipes replaced and leaking couplers rehabilitated in the irrigation facility at Ngaramtoni (SARI)		Rehabilitation of the cold room at SARI

Mozambique- Annex 4

Achievements against Activities, Outputs and Milestones: Summary table, 30 June 2010

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 1.1	**Initial characterization of ten maize-legume farming systems and selection of thirty research sites/communities**					
Activity 1.1.1	Exploratory visits to the target areas, selection of sites and community surveys within target countries	Program communities and sites selected and adjoining control or counterfactual villages identified First approximation of socioeconomic profile of the communities within each target zone developed to identify and target hot spots	Target sites and villages selected by June 2010	NARS economists and scientists from 5 countries (leaders), CIMMYT, ICRISAT and Australian partners	Moz: : site selection in progress (%%)	
Activity 1.1.2	Consultation and rapid appraisals for identifying agribusiness and market opportunities in maize-legume systems	Indicative opportunities for agribusiness and market development in maize-legume systems identified	Agribusiness opportunities identified in selected markets by August 2010	Lead: NARS economists and scientists from 5 countries: Partners: CIMMYT, ICRISAT and Australian partners, market orientated NGOs and relevant	E Moz: planned	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
				private sector associations		
Activity 1.1.3	Collection and analysis of secondary data (including any existing farm budget data) and mapping and characterization of the target farming systems in each country	GIS maps and socioeconomic and biophysical area profiles developed for selected farming systems	About Dec 2010 for data collection May 2011 for mapping of the results	NARS economists and scientists from 5 countries (leaders) for data collection CIMMYT (leader) for data analysis with support from Australian partners, NARS and ICRISAT QDEEDI (leader) for spatial characterizatio n and GIS mapping	Not started	
Output 1.2	**Understanding farmers' maize and legume production constraints and opportunities, crop and livestock interactions, resource use, technology preferences and market access in the ten farming systems**					
Activity 1.2.1	Developing standardized instruments and survey tools through consultation with program teams	Instruments, tools and protocols for survey data collection standardized for all participating countries	Aug 2010	CIMMYT(leade r), NARS and Australia, and ICRISAT	ESA: Partially achieved(80%) Instruments. tools and protocols developed and being shared with partners.	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Activity 1.2.2	Identification and training of enumerators, and implementation of farm household surveys	Villages and household types identified through household surveys and participating farmers & collaborators engaged Household data coded and entered into SPSS software for analysis	Surveys completed in 3 countries by Feb 2011 Surveys completed in 2 countries by August 2011	NARS (leaders) for supervision and implementing surveys, CIMMYT, Australia, and ICRISAT	Not started	
Activity 1.2.3	Villages and household types identified through household surveys and participating farmers engaged (in collaboration with 1.2.2)	Farm case studies identified and current farmer's decision on resource allocation and their consequences quantified in terms of productivity – risk – environmental consequences	June 2010	Lead: QDEEDI; Participate: ICRISAT; National Program staff[3]; CIMMYT; farmer and women's groups in the target communities	Not started	
Activity 1.2.4	Participatory diagnosis of rainfed maize and maize-legume systems options in Queensland, Australia	Improved understanding of the viability of rainfed maize-legume systems in	December 2010	Lead: QDEEDI; Participate: participating farmers; NARES	Not started	

[3] *In all cases, national programme staff include members of universities and graduate students*

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
		Queensland		Link: CIMMYT		
Output 1.3	**Understanding maize and legume input and output markets and value chains including chain constraints and opportunities, costs and pricing patterns associated with the ten farming systems**					
Output 1.4	**Several farm-household system options identified which are risk reducing and productivity enhancing for each of the ten farming systems for testing in the research sites/communities**					
Output 1.5	**Effective adoption and impact pathways assessed for ten maize-legume systems**					
Activity 1.5.1	Adoption and impact assessments will be conducted through farm household surveys in selected farming systems to identify impact pathways and facilitate learning, change and priority setting processes.	Evaluation criteria, indicators and monitoring processes selected by the team Evaluation criteria and feedback processes implemented on changes in productivity, risk, income, at multiple scales (field, household, community/district, region,	Year 1-4 (2010-2013)	CIMMYT (leader, development of indicators/survey tools) with support from ASARECA and all partners, NARS in each country (monitoring and documenting change)	Political and security conditions will remain stable in all target countries to allow continuous monitoring of changes attributable to the interventions.	Reliable data that w build from the base household data to better understand adoption patterns a outcomes and refin interventions throu incremental learnin and change by the program team

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
		and country New opportunities identified from linkages with other programs and local, regional activities (e.g. new products, generation of inter- regional and inter-country spillovers)				

Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not start postponed (to when?) , cancelled;
Output 2.1	**Identified options for systems intensification and diversification, that reduce risk in the ten farming systems using systems modeling**				

Objective 3: To increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
Output 3.1	**Ten to 15 stress tolerant maize varieties and 10 higher yielding**	15 maize hybrids and 10 legume			

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
	legume varieties available to farmers in the selected farming systems through farmer- and seed company-participatory variety evaluation and release	varieties adapted to farming systems released			
Activity 3.1.1	Data analysis workshop linked to first in-country planning meeting	Per farming system, identification of 4 pre-release (within NVMTs) or newly released hybrids and OPVs with potential suitability for the targeted farming system for use by Obj 2 and use in farmer-participatory evaluation (Obj 3)	Dec 2010	CIMMYT, NARS and seed company breeders	
Activity 3.1.2	Potential legume species and varieties for the target environment in the program countries analyzed with TL II partners.	Per farming system, 1-2 potential legume species and 2 varieties each for the target communities identified.	Dec 2010	ICRISAT in consultation with TL II partners, NARS	
Activity 3.1.3	Seed increase of pre-release and newly released maize hybrids and OPVs and legume species and varieties with potential suitability for the targeted farming system	Seed for farmer-participatory maize and legume variety evaluation	Dec 2010	NARS breeders, backstopped by CIMMYT	
Activity 3.1.4	Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species and varieties under farmer-representative and legume-intercrop/CA conditions	Maize hybrids and OPVs and legume varieties of different species suitable for the targeted farming system identified	Dec 2011	National breeders	
Activity 3.1.5	In parallel to farmer-participatory trials. seed production characteristics of elite maize hybrids and OPVs and legume varieties established	Per country, 3 producible maize hybrids and OPVs and 2 legume varieties suitable for the targeted farming system identified	Dec 2011	NARS breeders, backstopped by CIMMYT and TL II partners	
3.1.6	Improved GxExM analysis approaches applied to Regional Maize and Legume Variety Trials	Recommendation domains for OPVs and hybrids and legume species and varieties evaluated based on regional trials (which are executed by other program	Dec 2012	CIMMYT and ICRISAT breeder and agronomists	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
		such as DTMA or TL-II)			
Activity 3.1.7	Improved GxExM analysis approaches applied to Farmer participatory maize variety trials and NMVTs	Fast-tracked variety release in at least two member countries	Dec 2013	National breeders	
Activity 3.1.8	DUS and NMVT/VCU testing of selected maize OPVs and hybrids	Per country, 3 producible hybrids and OPVs released	Dec 2013	Variety release authorities	
Activity 3.1.9	Requirements for legume variety release completed for adapted varieties in each program country	At least one adapted legume variety released in each of the program countries.	Dec 2013	Variety release authorities	
Activity 3.1.10	Licensing of released hybrids and OPVs and if possible, legume varieties, to seed companies	Per country, 3 producible hybrids and OPVs and at least one legume variety licensed to seed companies	Dec 2013	NARS legal advisors	
Activity 3.1.11	Breeder seed production for seed companies and demonstrations	Per country, 1 ton of breeder seed for each of 3 producible hybrids and OPVs produced, and at least 500kg of legume variety breeder seed.	Dec 2013	National breeders	
Output 3.2	**Regional nursery for further improved (2nd generation) maize and legume varieties and hybrids**				
Activity 3.2.1	Seed increase of elite inbred lines and legume varieties generated in various programs	Regional nursery (maize) or bi-directional exchange (legume)	Apr 2010 (Eastern Africa) Dec 2010 (Southern Africa)	CIMMYT and TL II breeders	
Activity 3.2.2	Testcrossing of maize inbreds	Testcross progeny	Feb 2011 (Eastern Africa) Dec 2010 (Southern	CIMMYT and QDEEDI breeder	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
			Africa)		
Activity 3.2.3	Joint characterization of elite inbreds and legume varieties	Elite inbred and legume variety characterization for priority stresses in target countries	Oct 2012 (Eastern Africa) May 2011 (Southern Africa)	NARS, CIMMYT, TL II partners and QDEEDII breeders (QDEEDII for maize)	
Activity 3.2.4	Joint characterization of elite testcrosses in relevant farming systems, including with legume intercropping	Testcross characterization in various legume systems	Oct 2011 (Eastern Africa) May 2011 (Southern Africa)	NARS & CIMMYT breeders, QDEEDII	
3.2.5	Development of web platform including database for combination and effective exchange of germplasm information	Web-based access to regional germplasm characterization data and information	Dec 2012	CIMMYT	
Activity 3.2.6	Development and selection of new 2nd generation hybrids, OPVs and legume varieties based on joint germplasm characterization and predicted performance of hybrids/OPVs	Maize and legume varieties and hybrids with further improved adaptation to target farming systems, consideration of insights from household and value chain studies	Dec 2013	NARS, CIMMYT and TL II breeders	
Activity 3.2.7	Target farming system-related improvement of infrastructure for program execution	Irrigation for nurseries, contribution to cold room maintenance	Dec 2010	National breeders	
Activity 3.2.8	Assess opportunities for incorporating national germplasm into regional nursery	MoU for germplasm exchange established	Dec 2010	CIMMYT breeder and TL II Coordinator	
Output 3.3	**Environmental characterization**				
Activity 3.3.1	Environmental characterization of main CIMMYT, NARS and Queensland testing sites	Environmental characterization of 16 strategic maize testing sites in Africa and Australia	Dec 2013	CIMMYT and QDEEDI	

Objective 5: Capacity building to increase the efficiency of agricultural research today and in the future

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
Output 5.1	**Training on technology targeting and value chain analysis provided to build and enhance capacity of national and regional programs**				

Achievements against Activities, Outputs and Milestones: Summary table, 30 June 2010

Objective 1: To characterize maize-legume production and input and output value chain systems and impact pathways, and identify broad systemic constraints and options for field testing.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 1.1	**Initial characterization of ten maize-legume farming systems and selection of thirty research sites/communities**					
Activity 1.1.1	Exploratory visits to the target areas, selection of sites and community surveys within target countries	Program communities and sites selected and adjoining control or counterfactual villages identified First approximation of socioeconomic profile of the communities	Target sites and villages selected by June 2010	NARS economists and scientists from 5 countries (leaders), CIMMYT, ICRISAT and Australian partners	Moz: : site selection in progress (%%)	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
		within each target zone developed to identify and target hot spots				
Activity 1.1.2	Consultation and rapid appraisals for identifying agribusiness and market opportunities in maize-legume systems	Indicative opportunities for agribusiness and market development in maize-legume systems identified	Agribusiness opportunities identified in selected markets by August 2010	Lead: NARS economists and scientists from 5 countries: Partners: CIMMYT, ICRISAT and Australian partners, market orientated NGOs and relevant private sector associations	E Moz: planned	
Activity 1.1.3	Collection and analysis of secondary data (including any existing farm budget data) and mapping and characterization of the target farming systems in each country	GIS maps and socioeconomic and biophysical area profiles developed for selected farming systems	About Dec 2010 for data collection May 2011 for mapping of the results	NARS economists and scientists from 5 countries (leaders) for data collection CIMMYT (leader) for data analysis with support from Australian partners, NARS and ICRISAT QDEEDI (leader) for spatial characterizatio n and GIS	Not started	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
				mapping		
Output 1.2	**Understanding farmers' maize and legume production constraints and opportunities, crop and livestock interactions, resource use, technology preferences and market access in the ten farming systems**					
Activity 1.2.1	Developing standardized instruments and survey tools through consultation with program teams	Instruments, tools and protocols for survey data collection standardized for all participating countries	Aug 2010	CIMMYT(leader), NARS and Australia, and ICRISAT	ESA: Partially achieved(80%) Instruments. tools and protocols developed and being shared with partners.	
Activity 1.2.2	Identification and training of enumerators, and implementation of farm household surveys	Villages and household types identified through household surveys and participating farmers & collaborators engaged Household data coded and entered into SPSS software for analysis	Surveys completed in 3 countries by Feb 2011 Surveys completed in 2 countries by August 2011	NARS (leaders) for supervision and implementing surveys, CIMMYT, Australia, and ICRISAT	Not started	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Activity 1.2.3	Villages and household types identified through household surveys and participating farmers engaged (in collaboration with 1.2.2)	Farm case studies identified and current farmer's decision on resource allocation and their consequences quantified in terms of productivity – risk – environmental consequences	June 2010	Lead: QDEEDI; Participate: ICRISAT; National Program staff[4]; CIMMYT; farmer and women's groups in the target communities	Not started	
Activity 1.2.4	Participatory diagnosis of rainfed maize and maize-legume systems options in Queensland, Australia	Improved understanding of the viability of rainfed maize-legume systems in Queensland	December 2010	Lead: QDEEDI; Participate: participating farmers; NARES Link: CIMMYT	Not started	
Output 1.3	**Understanding maize and legume input and output markets and value chains including chain constraints and opportunities, costs and pricing patterns associated with the ten farming systems**					
Output 1.4	**Several farm-household system options identified which are risk reducing and productivity enhancing for each of the ten farming systems for testing in the research sites/communities**					

[4] *In all cases, national programme staff include members of universities and graduate students*

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;	Comments (implementation constraints
Output 1.5	**Effective adoption and impact pathways assessed for ten maize-legume systems**					
Activity 1.5.1	Adoption and impact assessments will be conducted through farm household surveys in selected farming systems to identify impact pathways and facilitate learning, change and priority setting processes.	Evaluation criteria, indicators and monitoring processes selected by the team Evaluation criteria and feedback processes implemented on changes in productivity, risk, income, at multiple scales (field, household, community/district, region, and country New opportunities identified from linkages with other programs and local, regional activities (e.g. new products, generation of inter- regional and inter-country spillovers)	Year 1-4 (2010-2013)	CIMMYT (leader, development of indicators/survey tools) with support from ASARECA and all partners, NARS in each country (monitoring and documenting change)	Political and security conditions will remain stable in all target countries to allow continuous monitoring of changes attributable to the interventions.	Reliable data that w build from the base household data to better understand adoption patterns a outcomes and refin interventions throu incremental learnin and change by the program team

Objective 2: To test and develop productive, resilient and sustainable smallholder maize-legume cropping systems and innovation systems for local scaling out

No.	Activity	Outputs/ Milestones	Due date of output/ milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not start postponed (to when?) , cancelled;
Output 2.1	**Identified options for systems intensification and diversification, that reduce risk in the ten farming systems using systems modeling**				

Objective 3: To increase the range of maize and legume varieties available for smallholders through accelerated breeding, regional testing and release, and availability of performance data.

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
Output 3.1	**Ten to 15 stress tolerant maize varieties and 10 higher yielding legume varieties available to farmers in the selected farming systems through farmer- and seed company-participatory variety evaluation and release**	15 maize hybrids and 10 legume varieties adapted to farming systems released			
Activity 3.1.1	Data analysis workshop linked to first in-country planning meeting	Per farming system, identification of 4 pre-release (within NVMTs) or newly released hybrids and OPVs with potential suitability for the targeted farming system for use by Obj 2 and use in farmer-participatory evaluation (Obj 3)	Dec 2010	CIMMYT, NARS and seed company breeders	
Activity 3.1.2	Potential legume species and varieties for the target environment in the program countries analyzed with TL II partners.	Per farming system, 1-2 potential legume species and 2 varieties each for the target communities identified.	Dec 2010	ICRISAT in consultation with TL II partners, NARS	
Activity 3.1.3	Seed increase of pre-release and newly released maize hybrids and OPVs and legume species and varieties with potential suitability for the targeted	Seed for farmer-participatory maize and legume variety evaluation	Dec 2010	NARS breeders, backstopped by CIMMYT	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
	farming system				
Activity 3.1.4	Farmer-participatory evaluation of pre-release and newly released maize hybrids and OPVs and legume species and varieties under farmer-representative and legume-intercrop/CA conditions	Maize hybrids and OPVs and legume varieties of different species suitable for the targeted farming system identified	Dec 2011	National breeders	
Activity 3.1.5	In parallel to farmer-participatory trials. seed production characteristics of elite maize hybrids and OPVs and legume varieties established	Per country, 3 producible maize hybrids and OPVs and 2 legume varieties suitable for the targeted farming system identified	Dec 2011	NARS breeders, backstopped by CIMMYT and TL II partners	
3.1.6	Improved GxExM analysis approaches applied to Regional Maize and Legume Variety Trials	Recommendation domains for OPVs and hybrids and legume species and varieties evaluated based on regional trials (which are executed by other program such as DTMA or TL-II)	Dec 2012	CIMMYT and ICRISAT breeder and agronomists	
Activity 3.1.7	Improved GxExM analysis approaches applied to Farmer participatory maize variety trials and NMVTs	Fast-tracked variety release in at least two member countries	Dec 2013	National breeders	
Activity 3.1.8	DUS and NMVT/VCU testing of selected maize OPVs and hybrids	Per country, 3 producible hybrids and OPVs released	Dec 2013	Variety release authorities	
Activity 3.1.9	Requirements for legume variety release completed for adapted varieties in each program country	At least one adapted legume variety released in each of the program countries.	Dec 2013	Variety release authorities	
Activity 3.1.10	Licensing of released hybrids and OPVs and if possible, legume varieties, to seed companies	Per country, 3 producible hybrids and OPVs and at least one legume variety licensed to seed companies	Dec 2013	NARS legal advisors	
Activity 3.1.11	Breeder seed production for seed companies and demonstrations	Per country, 1 ton of breeder seed for each of 3 producible hybrids and OPVs produced, and at least 500kg of legume variety	Dec 2013	National breeders	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
		breeder seed.			
Output 3.2	**Regional nursery for further improved (2nd generation) maize and legume varieties and hybrids**				
Activity 3.2.1	Seed increase of elite inbred lines and legume varieties generated in various programs	Regional nursery (maize) or bi-directional exchange (legume)	Apr 2010 (Eastern Africa) Dec 2010 (Southern Africa)	CIMMYT and TL II breeders	
Activity 3.2.2	Testcrossing of maize inbreds	Testcross progeny	Feb 2011 (Eastern Africa) Dec 2010 (Southern Africa)	CIMMYT and QDEEDI breeder	
Activity 3.2.3	Joint characterization of elite inbreds and legume varieties	Elite inbred and legume variety characterization for priority stresses in target countries	Oct 2012 (Eastern Africa) May 2011 (Southern Africa)	NARS, CIMMYT, TL II partners and QDEEDII breeders (QDEEDII for maize)	
Activity 3.2.4	Joint characterization of elite testcrosses in relevant farming systems, including with legume intercropping	Testcross characterization in various legume systems	Oct 2011 (Eastern Africa) May 2011 (Southern Africa)	NARS & CIMMYT breeders, QDEEDII	
3.2.5	Development of web platform including database for combination and effective exchange of germplasm information	Web-based access to regional germplasm characterization data and information	Dec 2012	CIMMYT	
Activity 3.2.6	Development and selection of new 2nd generation hybrids, OPVs and legume varieties based on joint germplasm characterization and predicted	Maize and legume varieties and hybrids with further improved adaptation to target farming systems, consideration of insights from household and	Dec 2013	NARS, CIMMYT and TL II breeders	

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
	performance of hybrids/OPVs	value chain studies			
Activity 3.2.7	Target farming system-related improvement of infrastructure for program execution	Irrigation for nurseries, contribution to cold room maintenance	Dec 2010	National breeders	
Activity 3.2.8	Assess opportunities for incorporating national germplasm into regional nursery	MoU for germplasm exchange established	Dec 2010	CIMMYT breeder and TL II Coordinator	
Output 3.3	**Environmental characterization**				
Activity 3.3.1	Environmental characterization of main CIMMYT, NARS and Queensland testing sites	Environmental characterization of 16 strategic maize testing sites in Africa and Australia	Dec 2013	CIMMYT and QDEEDI	

Objective 5: Capacity building to increase the efficiency of agricultural research today and in the future

No.	Outputs / Activities	Milestones	Due date of milestone	Responsible	Progress to 30 June 2010 (fully achieved, partially achieved (%?), in progress (%?), planned but not started, postponed (to when?) , cancelled;
Output 5.1	Training on technology targeting and value chain analysis provided to build and enhance capacity of national and regional programs				