

ICRAF ANNUAL REPORT

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Improving Smallholder Food Security, Nutrition and Income Through Increased Production and Marketing of Climbing Beans

To The McKnight Foundation

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1. Introduction

The World Agroforestry Centre (ICRAF) and its partners have tested and developed number of promising agroforestry technologies for soil fertility improvement and providing other goods and services in southern Africa. The most promising species for soil fertility improvement are *Gliricidia sepium*, *Sesbania sesban*, *Cajanus cajan* and *Tephrosia* (*Tephrosia vogelii* or *Tephrosia candida*), which are nitrogen-fixing leguminous species. The biomass and residues from these legumes provide important ecosystem services in addition to poles that can be used as staking materials and firewood. In countries such as Malawi where soil fertility depletion is high and staking material is difficult to obtain, agroforestry species provide a viable option. In the southern Malawi where most of the forests have been cleared staking materials are a very big problem hence planting of climbing beans is also declining.

Research conducted elsewhere on appropriate staking options of climbing beans has recommended the planting of leguminous agroforestry trees such as *Calliandra*, *Gliricidia*, *Leucaena*, *Sesbania* and *Tephrosia* species. These take six months to one year to produce sufficient staking material. Economical and optimal length of a stake is 2.0 m that is beyond the maize height. One stake supports 4 bean plants giving a rate of 5,000 stakes per hectare.

This project was initiated with the objective of offering mild and aggressive climbing bean germplasm with different staking options to farming communities in pilot sites in Mozambique and Malawi. The research on agroforestry systems described above have been tested on many cropping systems (e.g. maize-legume, crop-livestock, fresh vegetables) in the SADC region but productivity and profitability data are still missing for their compatibility with new varieties of climbing beans across different rainfall and altitude combinations.

One year has elapsed since the current project was initiated. The following progress report describes the research and development work undertaken during the past year and work plan and budget for the next year.

2. Progress report: Narrative Summary

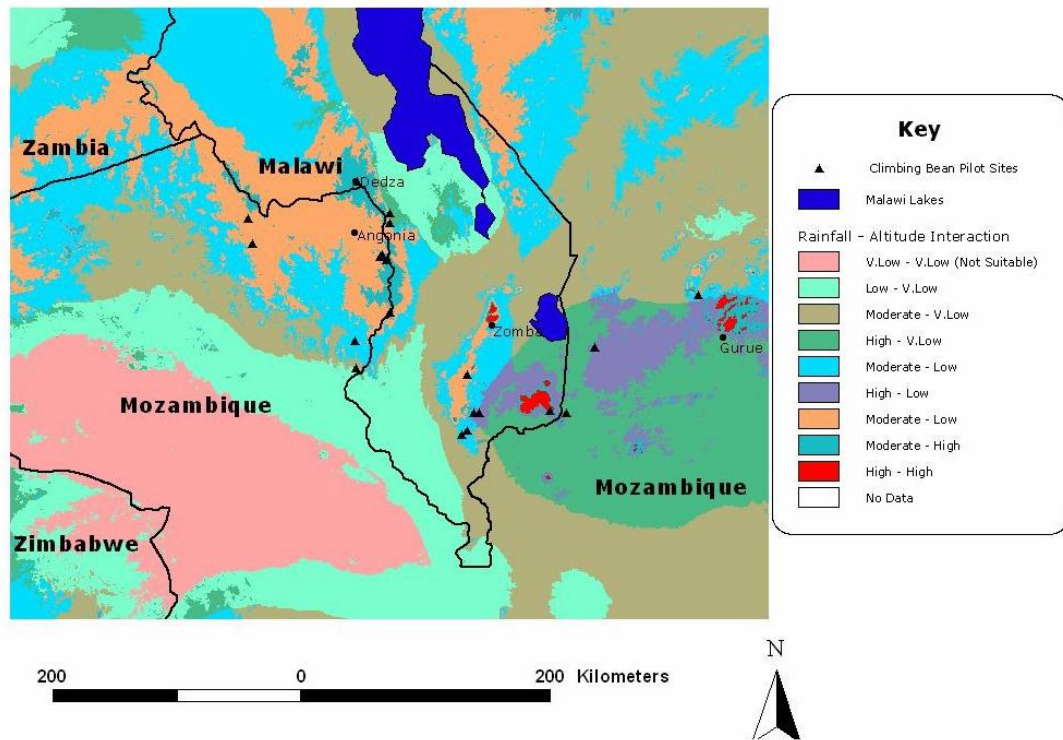
The following narrative summary is based on activities

Activity 1.1.1. Identification of project sites in two rainfall x four altitude zones

This activity was led by DARS, and ICRAF has played a key role. This activity has been completed, and the list of sites identified is given in the following table. The following map was also generated from the global positioning system (GPS) reading, rainfall and altitude data collected around the sites in Malawi and Mozambique.

Country	Site	District	Rainfall	Altitude
Malawi	Bembeke	Dedza	Moderate	High
	Njolomole	Ntcheu	Moderate	Moderate
	Kandeu	Ntcheu	Moderate	Low
	Lupia	Tyolo	High	Low
	Jayenda	Tyolo	High	Low
	Makwasa	Tyolo	Moderate	Low
	Masambanjati	Tyolo	Moderate	Low
	Chirazulu	Chirazulu	Moderate	Moderate
	Thondwe	Zomba	Moderate	Moderate
Mozambique	Jimo	Tsangano	Moderate	High
	Kalipali	Tsangano	Moderate	High
	Mwenjete	Tsangano	Moderate	High
	Chimkumba	Macanga	Moderate	High
	Namadende	Macanga	Moderate	High
	Mulumbu	Milanje/Gurue	High	Very low
	Mbozi	Border??	High	High
	Inhviha	Milanje/Gurue	High	Low
	Lioma	Milanje/Gurue	Moderate	Very low
	Musakama	Moatize	Low	Very low
Nkondezi	Moatize	Moderate	Low	

Pilot sites identified for the project



Activity 1.1.2. Participatory climbing bean variety selection and agroforestry tree specie selection.

This activity was led by DARS. ICRAF was involved in the selection of the agroforestry tree species. ICRAF has identified *Gliricidia sepium* (locally called Gliricidiya), *Sesbania sesban* (locally called Jerejere or Binu), *Tephrosia candida* (locally called Mthutu, Katupe, Wombwe or Mtetezga) and *Accacia angustissima* as the most appropriate species. The criteria used for the selection of the species were (1) proven performance in terms of growth, biomass production and nitrogen fixation to improve soil fertility and staking material, (2) ability to provide other environmental services such as provision of fodder, positive effect on soil biodiversity, suppression of weeds and other pests on companion crop such as maize, (3) absence of potential for being invasive weed, (4) acceptability by farmers and suitability to farming conditions in Malawi. These species have been evaluated on-station for over a decade in southern Africa and on farmers' fields in some parts of southern Malawi and Mozambique. The implication of this is that we now have appropriate and acceptable species for the next stage of the research and also for promotion in future development activities.

Forty (15 of which were women) development partners from Mozambique and Malawi, received training on Participatory Variety Selection (PVS) of climbing beans, , agronomic practices for the climbing beans, agroforestry technologies, tree nursery

establishment and management including tree planting and management. The three days training took place in October 2007 in Mulanje in Southern, Malawi. This training took place in preparation for implementing activity 1.1.3 at the beginning of the rainy season in November. Having received training (as in photo below) in raising agroforestry tree nurseries the participants were expected to begin implementing tree nurseries in their respective sites.



Photos 1 and 2: Some of the training participants trying their hands on some of new learnt nursery techniques

1.1.3. Identification and evaluation of best bet combinations (agroforestry soil fertility technology x rainfall x altitude x germplasm) disaggregated by gender

This activity was led by DARS, while ICRAF was involved to lesser degree. Demonstration (experimental) sites were identified and established this cropping season. Partners were trained by ICRAF in tree nursery establishment in readiness for this particular activity

3.1.1. Baseline survey and participatory development of monitoring and evaluation guidelines to establish references for measuring impact of the project (1 Baseline report, 1 document on guidelines for M&E system developed & used)

This activity was led by ICRAF. The activity was completed in Malawi and Mozambique. A total of 100 households in Mozambique and 120 households in Malawi were sampled. Data was collected on household characteristics, wealth category, climbing bean production and diffusion channels, existing climbing bean varieties, agroforestry technologies, bean markets, food security and diversity and human capital development. Data entry and analysis is in progress.