

Annual Progress Report – 2008 - Summary Information

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Project Title: Enhancing grain legumes' productivity, and production and the incomes of poor farmers in drought-prone areas of sub-Saharan Africa and South Asia

Organization Name: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Institute of Tropical Agriculture (IITA), International Center for Tropical Agriculture (CIAT)

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Annual Progress Report – 2007-2008: Narrative

Objective 1: Targeting crop breeding and seed delivery efforts to enhance the impact of the livelihoods of the poor in drought-prone regions of sub-Saharan Africa and South Asia

Objective 1 of the Tropical Legumes II Project implemented 5 major activities in year 1, namely: 1) development of standardized baseline and market survey instruments and methods; 2) baseline and market survey data collection; 3) compilation and analysis of secondary data for regional situation and outlook reports; 4) development of standardized survey form on end-users preferences for breeders to use in PVS implementation in Objectives 2-7; and 5) coordination and capacity building for NARS partners including regional partners workshops and training.

Important milestones/outputs were achieved during year 1 of the project:

- Follow-up country level project meetings in India, Kenya, Malawi, Nigeria and Niger where roles and responsibilities of project partners were clarified and workplans of all scientists were developed and reviewed
 - Socioeconomic tools, sampling methods and survey instruments adapted and harmonized
 - 3 standardized baseline survey instruments developed
 - Baseline socioeconomic database from stratified farm household samples in selected target locations – data entry 50% completed
 - Market surveys implemented covering key market players throughout the legume crop value chain – data collection and data entry on-going
 - Regional situation and outlook reports drafted
- Outputs include:
- Report on general review on chickpea, pigeonpea, groundnut, cowpea, soybeans and beans production in WCA, ESA and Asia
 - Draft regional situation and outlook reports completed for chickpea in Ethiopia groundnut and pigeonpea in Malawi and soybeans in Eastern Africa
 - Standardized survey tool on end-users' trait preferences designed for PVS implementation by the breeders in Objectives 2-7
 - NARS scientists capacity development for baseline data collection, analysis and reporting
 - Coordination meetings (virtual and actual) involving scientists from Asia, ESA and WCA conducted during the year

In Asia, the important milestones achieved by the research team during year 1 of the project, are as follows:

- Country level planning and review meetings with partners in the four states of India, namely ANGRAU, UAS Dharwad, UAS Bangalore, PKV Akola and TNAU
- Training workshops for baseline and market studies conducted
- Standardized baseline survey and key informant market survey instrument in Asia designed and integrated into the baseline surveys
- Essential survey modules developed and adapted: adoption, constraints, consumer and market preferences, cropping pattern, market or production utilization, sources of income and sources of information

- Standardized survey tool on end-user's trait preferences designed and availed for PVS implementation by other scientists in Objectives 2-7.
- Baseline socioeconomic database from stratified farm household samples in selected target locations and key informants data from selected markets developed
- Regional situation and outlook: draft overview for chickpea, pigeonpea and groundnut.

In ESA, the important milestones achieved during year 1 are as follows:

- Available data at zonal and district level for all crops, except chickpea in Tanzania has been mapped.
- Situation and outlook assessments have been almost completed for two countries.
- Baseline data has been collected from two target countries, Malawi and Ethiopia and in initial analysis has been done.
- Each of the different objective components of the project have already developed impact pathways outlining the roadmap
- Propensity score matching method is being developed and has been tested with data from Uganda for groundnuts.

In WCA, the important milestones achieved are:

- Standardized baseline survey instruments were developed by ICRISAT-Niamey and shared with partners.
- Household and market surveys were undertaken.
- Baseline surveys are in progress.
- Farmer and market traits preference survey is going on in all countries
- PVS survey tool developed and shared with partners.

The details of the achievements during the year by activity and milestone are as follows:

Activity 1.1: Baseline studies, situation outlook analyses for targeted legumes

- **Milestone 1.1.1:** Standardized baseline survey instruments and methods

The socioeconomic studies in Objective 1 establishes an overall baseline framework for assessing ex-post the technology uptake and impact of improved varieties on the food security and poverty status of the farm households producing groundnut, chickpea and pigeonpea in drought-prone regions of South Asia and Sub-Saharan Africa. The baseline household and market survey questionnaires have been adapted from the standardized instruments developed under Objective 1 to gather data on i) basic farm and household characteristics, ii) assets, resource endowments and major sources of income; iii) cropping patterns, input use, production and yields; iv) adoption of chickpea, pigeonpea, and groundnut varieties and trait preferences; v) constraints and characteristics of cultivars grown; vi) major characteristics farmers are looking for in a new cultivar; vii) pattern of utilization of output, processing, marketing and seed systems; viii) gender roles in input supply, food production and marketing and woman's access to productive assets and financial resources.

The draft instruments were coordinated and shared by the Objective 1 Global Coordinator (C Bantilan) across all regions and all partners for their adaptation and implementation. These standardized instruments were field tested and shared with all project scientists from all regions. The survey instruments developed are: a) baseline survey instrument for household surveys; b) instruments for key market players through the legume crops value chain (with particular emphasis on preferred traits); and c) PVS questionnaire on end-users preferences for breeders' implementation in the Project Objectives 2-7.

In Asia, selection of the baseline and market survey sites were undertaken in the same four major growing states of chickpea, pigeonpea and groundnut targeted by the breeders in Objectives 2-4. The district and village survey sites were selected in coordination with biological scientists following a set of criteria including: importance of the crop, rainfall pattern, soil types, and access to markets. The breeders' suggestion that an additional consideration, i.e willingness to participate or cooperate in the program, was taken on board. A stratified random selection of households (stratified by land holding) was designed for each of the selected village sites (beneficiary and control). So far, the baseline data collection for chickpea and pigeonpea and groundnut covering the 4 targeted states of India - Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu has been completed except for the second district in Tamil Nadu. (Appendix 1). Following a stratified random selection of households (based on land holding as stratification variable) for each of the 6 villages in the 10 districts, a total 1350 randomly selected households were surveyed (900 from beneficiary villages and 450 from control villages). There were 540 households for chickpea, 540 for groundnut and 270 for pigeonpea. For the market survey, a total of 75 market players (including consumers) have been covered per district per crop. The markets nearest to the villages being surveyed are selected to cover both informal and regular markets.

In ESA, a standardized survey instrument was then developed at two levels (household and village/community) for all countries to gather comparable data for understanding limiting constraints, farmer and market preferences and measuring adoption and multi-dimensional impacts of the project.

In Ethiopia a total of 700 randomly selected households were surveyed in 3 purposefully selected target districts and 26 Kebeles (Local Councils). This included 400 households in the two districts (Minjar-Shenkora and Gimbichu) targeted under the TL-II project and 300 households in one district (Lume-Ejere) selected for IFAD project. A multi-stage sampling procedure was followed in which all the chickpea growing Kebeles in the target districts were identified and a random sample of 26 Kebeles selected for the survey from which a sample of households were further identified. Village level data was also collected from about 40 villages that fall within the 26 Kebeles. EIAR/DZARC took the lead for the baseline survey in Ethiopia. While the larger dataset will help us understand the broader production and market constraints for chickpea in Ethiopia, only the data from the 400 households will be relevant in evaluating the adoption and impact of the TL-II project.

In Malawi a total of 594 randomly selected households were surveyed in 4 purposively selected districts. The multi-stage sampling process included selection of 16 Sections (4 per district) and 48 villages (4 randomly selected among the groundnut and pigeonpea growing villages in each Section). The sample included 298 households in 2 districts (Michinji and Balala) targeted under

the TL-II project and 296 households in 2 other districts (Thyolo and Chiradzulu) targeted under the sister project supported by IFAD. The village level data was also collected from 47 villages in the 4 districts. About 22% of the sampled households were female-headed, while about 50% of the respondents were also females. The Malawi baseline was coordinated by ICRISAT-Malawi with support from the University of Malawi.

In WCA, in each country 6 project sites are selected and 6 control sites.

Milestone 1.1.2: Regional situation and outlook reports for targeted legumes in targeted regions

Data compilation for regional situation and outlook report for targeted legumes is in progress.

Progress of situation and outlook in Asia:

In Asia, the data collection and analysis for the situation and outlook reports is on-going.

Asia and South Asia in particular, accounts for a significant portion of global production of chickpea, pigeonpea and groundnut. 89% of global chickpea production, 90% of global pigeonpea production, and 66% of global groundnut production comes from Asia. The main growing countries for chickpea are India, Turkey, Pakistan, Iran and Canada which together account for 87% of the global production. For pigeonpea, the main growing countries are India, Myanmar, Kenya, Uganda and Malawi, together accounting for 97% of global pigeon pea production. Groundnut is grown mainly in China, India, Nigeria, United States of America and Indonesia, which together account for 76% of the global production.

Chickpea trends in India:

The overall growth rate of production in India during the period 1965-2004 was a low 0.33%, the growth rate of area decreased in the same period by 0.57% per annum while yields grew at 0.91% per annum. These historical growth rates for the country masks the dynamic changes in chickpea area and production at a more regional level resulting in a shift in the centre of production away from the traditional growing areas in northern and north-eastern India to central and peninsular India.

Between 1965-69 (avg.) and 2000-04 (avg.) the chickpea area in Uttar Pradesh, Bihar, Haryana, Punjab and West Bengal declined from 4.3 million ha to 1.1 million ha and its production fell from 3.1 million t to 1.0 million t. In contrast, there has been expansion in the area under chickpea in Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Chhattisgarh, and Maharashtra, from 2.2 million ha to 4.2 million ha and production from 1.0 to 3.2 million ha during the same period. The change is also reflected at the district level between 1966 and 2001-03. Chickpea are decreased in a number of large chickpea growing districts while increasing in many districts from a low initial base.

As a consequence in 2004, the semi-arid tropic region contributed 58.2% of total chickpea production in India compared to 18.3% in 1968. The temperate SAT region now accounts for only 29% of the total production compared to 54% in 1968. This shift in the center of production was possible due to the development of improved varieties of early maturing chickpea cultivars

tolerant to heat stress and with resistance to Fusarium wilt leading to higher and stable yields. The productivity of chickpea has not gone down despite being relegated to marginal and high-risk prone areas with shorter growth cycle to avoid terminal drought. On the contrary, yields in the non-traditional growing areas in the central and peninsular India increased by 1.7% between 1965-2004 and are now at par with the yield levels in the traditional growing areas.

Despite the slower growth in yields the percentage of districts which recorded yields of over 800 kg/ha increased from 10% in 1966 to 52% in 2003. This is reflected in chickpea area, with 50% of area was under high i.e., >800 kg/ha yields compared to only 16% in mid sixties.

Chickpea Price Trends. Globally nominal prices have been increasing at the rate of 3.13% per annum between 1960-225, but real prices of chickpeas have been decreasing at the rate of -1.79% during the same period. There has been an increase in the real prices as well in the recent years, with prices increasing at 1.15% between 2000-05 largely due to adverse weather conditions in the major growing countries and an increased demand from India.

Pigeonpea trends in India

The country wide trends of pigeonpea suggest that unlike chickpea and groundnut, the growth in the production over the period 1965-2004 is mainly derived from an area expansion while yield growth has remained static. These are reflected in the annual growth of production of 1.16%, and area 1.13% while yields stagnated at 0.03% .

Like for chickpea there have been dynamic changes in pigeonpea area across districts with area increasing in a number of districts while decreasing in several others. Among the major growing states, the relative share of Maharashtra in pigeonpea production has increased the most from 18% in 1970 to 31% in 2004, while that of Uttar Pradesh has declined drastically from 36% to 18% during the same period.

The semi-arid tropics in India has always been the traditional growing region for pigeonpea and in 1966 it contributed slightly over 50% of the total production in India. With the adoption of short and medium duration varieties that fit in the semi-arid cropping systems, this region in 2004 was contributing nearly 70% of the total production in India. The relative share of all other regions- humid, semi arid temperate and arid- have declined.

For 40% of the pigeonpea growing districts in India the yields are low while, it is high >770 in 36% of the districts. 40% of the total pigeonpea area still falls under yields less than 600 kg/ha in 2004.

Groundnut trends in India

Groundnut production in India has followed a cyclical and generally upward trending curve. Despite high fluctuations and stagnant or decreasing area, production in India has grown at 1.07 % per annum during 1965-2004 due to yield increases which grew at 1.18% per annum. The trends in the major growing regions are reflective of the national trends. Semi-arid tropics in India continue to be the dominant producer contributing 73% of the country's production in 2004. However, despite the yield growth between 1966 and 2004, the percentage of districts with high yields (over 1,050 kg/ha) increased from 6% to only 41%, and only 53% of groundnut area came under high yields.

Groundnut Price Trends. Globally the prices of both shelled groundnut, and groundnut oil have been declining in real terms. Shelled groundnut declined at a rate of 2.67% and groundnut oil by 2.8% in the period 1970-2005. Nominally the prices of both shelled groundnut and groundnut oil have increased at rates of 1.96 and 1.81% respectively.

Situation and outlook in ESA:

In ESA, the situation and outlook assessments have been almost completed for two countries involving three dryland legumes: chickpea (Ethiopia) and groundnut and pigeonpea (Malawi). This was undertaken based on data and literature collected from various sources and followed a sub-sector approach to document current production condition, available varieties, seed delivery systems, market and trade conditions. This was enhanced further by examining price trends, and projection of area and production based on analysis of historical data.

Available data for the two countries are compiled from different sources and a synthesis generated to identify key constraints, past successes and knowledge gaps for future research. The study identifies the constraints along the value chains for targeted legumes in targeted countries. Similar efforts are underway to develop a report on the situation and outlooks for three target crops in Tanzania. Once completed, the country sub-sector assessments will feed into regional situation and outlook reports that would outline the current production conditions, key socioeconomic and technological constraints and key interventions for unlocking the potential of the targeted legumes in the region.

- **Milestone 1.1.3:** Baseline socioeconomic database from stratified farm household samples in selected target locations

Baseline surveys were conducted in representative sample of locations where PVS and seed multiplication activities are being carried out to ensure that early adoption assessments will be undertaken in the same areas where early adoption would most likely occur. The surveys were implemented to allow measurement and tracking of impact pathways by assessing the alternative conditions, i.e. a) with technology interventions and corresponding counter-factuals; and b) comparisons before and after the project. Complementary market surveys were also implemented by targeting key informants - middlemen, traders, processors, retailers and consumers. Other supporting methodologies and tools included focus group discussions and use of local seed samples during the interaction with farmers.

The surveys were implemented to allow measurement and tracking of impact by assessing the alternative conditions, i.e. a) with technology interventions and corresponding counter-factuals; and b) comparisons before and after the project. The baseline surveys were conducted in representative sample of locations where PVS and seed multiplication activities are being carried out to ensure that early adoption assessments will be undertaken in the same areas where early adoption would most likely occur. Data collected from these surveys establishes a benchmark for assessing ex-post (after some years) the adoption and impact of improved legume varieties on the food security and poverty status of the farm households producing these crops.

The baseline surveys for chickpea in both Asia and East and Southern Africa commenced immediately as soon as the instruments were developed during the last quarter of 2007 in order

to capture the chickpea growing season in a timely manner. Following surveys throughout the subsequent growing seasons for pigeonpea, groundnut, cowpea, beans, and soybeans were appropriately implemented in the target production domains after adaptation of the standardized instruments, format and agreed protocols. The complementary market studies were also conducted by interviewing key informants – middlemen, traders, processors, retailers and consumers. The country level project sites for the baseline surveys of Objective 1 is shown below.

Baseline and market surveys by location	Groundnut	Chick- pea	Pigeon-pea	Cow- pea	Bean	Soybeans
South Asia						
India	X	X	X	-	-	
W & C Africa						
Mali	X	-	-	X	-	
Niger	X	-	-	X	-	
Nigeria	X	-	-	X	-	X
ES Africa						
Ethiopia	-	X	-	-	X	
Kenya	-	X	-	-	X	X
Malawi	X	-	X	-	X	X
Mozambique	X	-	-	X	-	X
Tanzania	X	X	X	X	X	X

Preliminary results: Highlights of initial results are given below. At this point, 50% of data entry is completed and baseline report due on October 2009.

Preliminary results for Asia: Chickpea, pigeonpea and groundnut

The phenomena of ruling varieties for decades in India. Farmers were asked about the cultivars currently grown. Based on the preliminary summaries derived for groundnut, pigeonpea and chickpea, it is striking to note that cultivars released as long as 15 to 50 ago continue to be adopted by farmers and seem to continue to dominate farmers' fields in major growing states of India. The phenomena of ruling varieties for decades in India raises several questions. Systematic analysis of the data collected (data entry and processing currently underway) is expected to provide essential information for better targeting breeding efforts as well as in addressing constraints faced in India.

Assessment of preferences across the value chain. Preliminary results from the first set of validated data from baseline and market surveys provide insights on the distinct preferences of key players along the market value chain - farmers, commission agents, traders, processors, exporters/importers, retailers and consumers. The illustrative pattern is a useful tool in drawing attention on the critical value of users' preferences and the importance of a coalition approach involving key actors throughout the value chain in technology development. In this case,

research objectives may need to be reevaluated to reflect the relevance of critical factors in addition to traditional research objectives.

Insights focusing on issues related to drought. The questions often asked about drought is, by how much would crop productivity or production decline due to drought? Similarly what is the obverse in a good year? How often does drought occur in say 5 -10 years? Additionally there are other questions related to coping strategy. Using 38 years of district level data we try to understand the first two questions raised above. Preliminary findings indicate that in the semi-arid tropics where most of the groundnuts are grown every 3rd year could be a drought effecting productivity by 10-25% at least. Like groundnuts, the highest variability in chickpea yields is in the arid zone with yields declining by more than 10% in 16 out of 38 years and the highest decline was 30%. For the semi-arid tropics, in only 6 out of 38 years yields decline by more than 10% and the highest decline was 20%. For pigeonpea, in only 7 out of 38 years, yields declined by more than 10%. The yield instability however, seems to have increased.

Critical questions for potential feedback process

- What research priorities are implied to achieve a better match between research objectives and farmers' objectives?
- How do key players along the value chain be effectively involved in setting research directions?
- What do the data on cost and returns and profitability in crop production under rainfed conditions imply? Initial results must be carefully examined to confirm the viability of agriculture in drought-prone environment. Does the data justify support price for rainfed crops?
- What do gender differentiated preferences imply about technology design and targeting breeding efforts and delivery systems?

Preliminary results for ESA: Chickpea, pigeonpea and groundnut

In ESA, this is one of the most demanding activities and milestones planned for 2008. Baseline data has been collected from two target countries (Malawi and Ethiopia). The baseline studies also benefited from other complimentary projects in terms of sharing fixed costs which allowed surveying a larger sample of the target farmers.

In order to improve data quality and comparability across countries, data entry and verification is being led by ICRISAT-Nairobi, and at the time of reporting, the data entry for Malawi has been completed while the Ethiopia data is near completion.

Socioeconomic profiles and preferences of target farmers

Some initial and selective analysis of the Malawi baseline shows the following results:

- The poverty levels in the surveyed villages are very high – about 75% for the pooled data, 80% for female-headed households and 70% for male-headed households. The average area under groundnuts
- The average farm sizes is about 1 ha – showing high levels of land scarcity. This varied from 0.39 ha for the first quartile to 1.9 ha for the forth quartile of the households

- About 81% and 84% of the sample households grew groundnut and pigeonpea, respectively. The average area planted for the two crops during the 2007/08 season is 0.71 acre and 0.76 hectares.
- The level of adoption of new varieties is higher for groundnuts (24% of groundnut area) than for pigeonpea (5% of pigeonpea area)
- Ownership of ICT varied from 2.5% for TV and 5% for mobile phones to 53% for radio
- Local groundnut varieties have high scores for culinary traits – but lower values for agronomic traits (yield, drought, disease and pest tolerance)
- The overall scores for the existing varieties show that CG7 and Chalimbana05 are more preferred than local cultivars while ICG 12991 and ICGV 90704 are slightly more preferred. JL-24 and RGI are less preferred than local cultivars mainly due to susceptibility to drought, diseases and pests. The scores do not seem to vary by gender.
- On average improved groundnut varieties have 10-15% yield advantage
- The variety scores for pigeonpea show that ICEAP 00040 performing better than the local varieties mainly because of its high scores in terms of stress tolerance
- Mthawajune is the most popular and highly ranked local variety
- Women gave lower scores for color and cooking time – indicating that they see the existing cultivars much differently than men

Basic characteristics of seed systems

Initial analysis of the baseline data for Malawi show the following key features in relation to the basic characteristics and performance of seed systems.

Groundnut: For groundnut about 63% of the seed used comes from own farm-saved recycled seed. Some 57% of the farmers depend on this source. About 16% of the seed is bought from local seed markets while about 18% comes from informal farmer-to-farmer seed exchange. About 24% of the farmers bought seed from local markets. The average amount bought from different sources ranges from 7 to 8 kg. The amount received through informal seed exchanges range from 1 kg to 40 kg with an average of 14.8 kg. About 16% of the farmers rely on these informal sources.

Pigeonpea: For pigeonpea about 70% of the seed used comes from own farm-saved recycled seed. About 74% of the farmers depend on this source. About 20% of the seed is bought from local seed markets while about 11% comes from informal farmer-to-farmer seed exchange. About 17% of the farmers bought seed from local markets. The average amount bought from different sources ranges between 3 to 6 kg. The amount received through informal seed exchanges range from 1 kg to 10 kg with an average of 4.7 kg.

Common beans in Eastern Africa

The beans component of TL II Objective 1 covers 1) targeting; 2) regional situational and outlook analysis and baseline studies; and 3) assessment of end-user preferred traits in Objectives 2 to 7 PVS activities and conduct early adoption studies. Regional situational and outlook analysis has been done for 10 principal bean-producing countries of East and Southern

Africa with special emphasis on the TL II target countries (Ethiopia, Kenya, Malawi and Tanzania). First draft of this study was scheduled for completion in second week of September.

Socio-economic baseline surveys covered the farming communities (community & individual household interviews), bean markets and input suppliers (particularly seed suppliers) in Ethiopia and Kenya. In both countries (data on poverty levels in Kenya and literacy in Ethiopia) were used in conjunction with rainfall and 'failed season models' to target the communities selected for the baseline surveys. In Kenya the targeting was a combination of poverty data (poverty levels between 60-80%) and annual rainfall (900-1000mm per year split between two seasons). The actual choice of sites (sub-locations) for action and counter-factual sites was done with KARI-Katumani scientists. In Ethiopia two different zones are being targeted according to the importance of beans for markets and food security. We have applied the same basic variables but augmented by information on the demand for different varieties (for demonstration & multiplication) from the seed systems component. A total of 360 households will be interviewed in the individual household surveys.

Over all, baseline surveys are being conducted in three regions (two from Ethiopia and one from Kenya). From each region, two districts at least 100 km apart were selected for the baseline study. The district (wereda) served as the secondary sampling unit in Ethiopia while a sub-location was the secondary sampling unit in Kenya. The primary sampling unit was a village in both countries and three villages producing common bean were randomly selected from each secondary sampling unit.

So far:

- A total 240 households (67 percent of the overall sample) have been interviewed. About 120 households were from Eastern Kenya and 120 from Oromiya in Ethiopia. We could have completed interviewing all 360 households but because the cropping season is at its peak in Ethiopia, we had to put the survey of farming systems to a halt and more work will resume in October 2008. Moreover, it proved difficult to access most communities by roads during rainy seasons.
- Out of 240 questionnaires filled, 100 questionnaires have already been entered into the computer.
- The questionnaire for informal seed suppliers has been adapted to suit the target crop in target countries and pre-tested in Kenya. It is now undergoing revision and will be implemented soon.

A report is being prepared on the assessment of different indices of drought that will be used in the evaluation of the scaling-out potential of different drought-tolerant bean varieties. A hierarchy of indices can be observed from simple rainfall amounts, through water-balance models to crop simulation models. It can be seen that some of the simpler indices are unable to provide the precision necessary for widespread dissemination of particular varieties. Climatic data alone are also unlikely to be sufficient and accurate information on soils and varietal adaptation will be required. Capacity is being built within CIAT HQ to allow for the modeling over large areas of climate risks.

In addition to objective indicators of drought are the perceptions of drought and the coping mechanisms of producers to deal with up to four different drought scenarios experienced in east and southern Africa.

PVS evaluation tools for individual participants (farmers & traders) were developed and a training program in PVS is scheduled for 20-27 September 2008 to assess end-user preferred traits and carry out early adoption studies in the activities of Objectives 2 to 7.

Preliminary results for WCA: Groundnut

In ICRISAT-WCA, in each country 6 project sites are selected and 6 control sites. In Mali, (partially completed in Mali because of insufficient funds), baseline survey output is partially achieved. The survey was to be carried out in the regions of Kolokani and Kayes. However, the survey only took place in the region of Kolokani where 3 sites were selected namely Faladié, Diorila and Marako.

Household and market surveys were undertaken. Twenty households were selected in each sites (15 project participants and 5 non-participants). In addition in each control site, 10 farmers were selected and interviewed. Overall a total of 90 farmers were interviewed.

In each commune, in the market survey, 10 traders (producers, collectors and retailers) were interviewed. Thus a total of 30 traders were interviewed in the relevant markets. Data entry done.

In Niger, the household and market baseline surveys were undertaken in the Dosso region. Essentially, 6 project villages (Tanda, Guidan Gaba, Koma beri, Tounga, Wassangou, Doula) and 6 control sites (Talambou, Makangara, Baliloua, Goulma Hamani, Sabarou, Garin Banguiro) were selected (table 1). In each project site, 35 farmers were surveyed. In every control site, 10 farmers were randomly selected.

In each project village, 15 participants were selected from mother trials, 10 from baby trials and 10 non-participants from each village. In each control village, 10 households were selected.

With regard to market survey, 10 markets were targeted in project and control sites. There are the Tanda, Malgorou, Bela, Dioudiou, Boureini, Kargui Bangou, Guechéme, Lido, Doula, Koré Mairoua markets. A total of 160 traders (27 collectors, 21 wholesalers, 25 retailers, 37 processors, 11 consumers, 32 producers and 7 exporters) were interviewed.

Data entry completed and cleaned and the report is under development.

In Nigeria, baseline surveys have not started because of internal problems on who should lead the socio-economic component. With Prof. Ben Ahmed being confirmed by the Director of IAR as the focal point, we (Jupiter and Ben) will conduct the different survey starting Mid-October 2008.

Cowpea and soybeans in Western and East Southern Africa

The approach in the socio-economics studies accounts for conditions with and without as well as before and after the project and is part of an overall monitoring and evaluation framework aimed at measuring and attributing the short- and long-term impacts of the project. PVS, gap analysis, seed delivery systems and baseline household survey questionnaires were developed to gather data on: (1) basic farm and household characteristics; (2) cropping patterns, input use, production, and yields; (3) gaps between research, extension and farmers; (4) vulnerability (drought, pests, diseases, and prices) and coping strategies; (5) gender roles in input supply, food production and marketing and women's access to productive assets and financial resources; (6) adoption of cowpea and soybean varieties and trait preferences; (7) cowpea and soybean seed systems; and (8) cowpea and soybean processing and marketing. In addition to the questionnaires, other supporting tools included improved and local seed samples and GPS equipment.

Baseline surveys were conducted in the same areas where PVS and seed multiplication activities were carried out to ensure that early adoption and impact assessment will be undertaken in the same areas where early adoption would most likely occur. Sample villages varied from 10 to 20 according to the size of sites with an average of two-thirds of villages selected randomly from a list of major cowpea or soybean growing areas and one-third of them were used as control villages. An average of 15 households was randomly selected in each village. The sample households varied from 150 to 300 households. In Malawi for instance, a total of 300 households were selected for baseline study and female-headed households accounted for 24% of the sample households.

Preliminary results suggest that technological interventions should be targeted in the context of broader development challenges relating to the vulnerability and coping strategies of rural households for greater impact on poverty reduction. In this regard, the sample households were interviewed to generate information to facilitate our understanding of their perceptions of the sources of vulnerability, ex ante risk management options, and ex post coping mechanisms. Linkages need to be developed and or strengthened. Furthermore, a more focused approach and coordination of efforts of the stakeholders are needed to bridge these gaps, boost production and increase value added as food and cash incomes. Such gaps can be noted clearly for soybean in Tanzania and Kenya where average market price is often higher than world price, reducing the competitiveness for local supply. Many industries (micro/small/medium/large) that process soybean in Kenya have to rely heavily on imports because of shortage in soybean supply. Research is still needed to assess and quantify the actual and potential impact of the adoption of improved varieties of cowpea on farmers' welfare, nutritional status, gender relations, soil fertility improvement, and crop-livestock integration systems. Women play key roles in agricultural production, but agriculture is increasingly characterized by growing gender imbalances in access to key productive assets such as land, animal power, and education. The survey results suggest that women have no control over their own productive assets and the resulting incomes. Appropriate crop variety development requires the involvement of end users—such as farmers and processors—in variety selection based on their preferences for several different traits. Most of the soybean and cowpea producers indicated a clear preference for improved varieties with high grain yield.

New technology often results in a shift in cropping pattern and increased incomes following changes in relative benefits from the production of alternative crops. Assessing the impact of improved cowpea and soybean varieties on cropping patterns and incomes would however require baseline information on the relative importance of crops for the target and control households in terms of cultivated land. A successful cowpea and soybean technological innovation would be expected to raise the relative benefits from these crops that would result in a shift in cropping patterns with greater share of cultivated land planted to cowpea and soybean by the target households.

- **Milestone 1.1.4:** Four baseline reports for targeted legumes

Database being completed; reports due for submission in Oct 2009.

Activity 1.2: Development of survey tools for PVS trials and seed market survey and assessment of early adoption

- **Milestone 1.2.1:** Standardized survey tool on end-user's preferences designed for PVS implementation in Objectives 2-7

The PVS questionnaire for participatory evaluation of improved cultivars was developed in consultation with national programs and with technical input from social scientists and breeders in Africa and Asia. Field-testing of the instruments was also undertaken prior to their finalization. In December 2007, the revised pro-forma was circulated among breeders for their use and implementation in Objectives 2-7.

In ICRISAT- WCA, this was developed and shared with partners. Farmer and market traits preference survey is on-going in all the countries.

- **Milestone 1.2.2:** Joint report on farmer and market-preferred traits reflecting gender dimensions

Not scheduled in year 1.

- **Milestone 1.2.3** Adoption and impact assessment framework developed

The adoption and impact assessment framework has been incorporated in the design of the baseline surveys to ensure the inclusion of action and counter-factual sites that will enable comparative analysis to assess adoption and impacts. The recent methodology developed by Moyo, Norton et al. (2007) published in *American Journal of Agricultural Economics* for evaluating the poverty ex-ante impacts of agricultural interventions has also been by the ESA team for possible application in all regions under this project.

Impact evaluation will aim to measure the project's success in achieving stated objectives using a counterfactual. While process evaluation requires careful description and monitoring of activities and outcomes, impact evaluation requires measurement of tangible indicators affected by the program and how this differs from the situation without interventions (counterfactual). The

propensity score matching (PSM) method is being developed to identify a matched sample of non-adopters (a comparator group having similar characteristics as adopters) among the baseline households which will serve as a counterfactual. Using the baseline surveys from the same target areas, this approach allows identifying valid comparator group of households (counterfactuals) sharing the same characteristics and probability of adoption of new technologies. This methodology is being developed and has been tested with data from Uganda for groundnuts.

With the completion of the baseline survey, it has become important to develop mechanisms for project monitoring and evaluation. Each of the different Objective components of the project have already development impact pathways outlining the roadmap for translating activities into measurable outputs, which in turn lead to desirable outcomes and ultimately into impacts of the project over the long term. Enhancing attribution and project effectiveness in meeting desired goals would require steps for process evaluation and impact assessment. Process evaluation will aim to determine to what extent the project has been implemented as planned and identify operational and strategic lessons for smooth implementation. Monitoring will involve description and measurement of observed outcomes along defined metrics agreed a priori. The baseline data collected is an important monitoring tool for establishing benchmarks and measuring progress against selected impact indicators. The key indicators for impact – both qualitative and quantitative – are being developed.

- **Milestone 1.2.4:** Early adoption assessment undertaken only where uptake is significant using one case study per region

Not scheduled in year 1; and scheduled for implementation after 2-3 seasons.

- **Milestone 1.2.5:** Seed market survey tools designed for implementation by scientists in Objective 8 (This milestone links with the work plan of objective 8 which targets only groundnut in WCA, beans in ESA, and cowpea)

The standardized market survey in Asia has been integrated into the baselines surveys reported in milestone 1.1.3.

A standardized seed and grain market module for Africa developed by CIAT team for beans was made available in Feb 2008 for adaptation to ESA. Furthermore, the seed market survey tool has been integrated into the household survey instruments used in chickpea, pigeonpea and groundnut surveys in ESA, noting that there are no active seed markets warranting a separate market survey. Following the above activities, the seeds market module for groundnut and cowpea in WCA will also be developed.

Activity 1.3 Targeting innovations for up-scaling and for reaching vulnerable groups

Milestone 1.3.1: Report on legume agro-ecosystems characterization using GIS tools in terms of growing areas, drought and poverty

Data collection commenced with the leadership of CIAT for beans. For other crops in ESA, available data for all the target crops has been collected from all the three countries – chickpea

(Ethiopia), groundnut and pigeonpea (Malawi) and groundnut and pigeonpea (Tanzania). Whereas information is available at the local level in areas or districts where project activities have started, other essential data are not available even at the national level. The available data at the zonal and district levels for all crops (except chickpea in Tanzania) has been mapped to help delineate and define the major production areas and target regions for the project in each country. The next stage will be to map the recommendation domains for selected legume varieties within the broader production region to facilitate technology targeting and up-scaling efforts. Similar data collection efforts are being done in other regions.

Milestone 1.3.2: Report on recommendation domains and strategies for better targeting of vulnerable groups

Not scheduled in year 1.

Activity 1.4: Capacity building for NARS partners

Milestone 1.4.1: At least 200 NARS partners trained through 5 short term trainings and 2 workshops.

Sub-activity 1.4.1.2: Training of at least 10 national staff and partners through short-term training/workshop on adoption and impact assessments

To enhance capacity building, training of national staff and partners in the four states of India were conducted by ICRISAT scientists through short-term training and on-the-job training. The training sessions provided a forum for discussion of problems encountered and issues related to baseline and market survey methodologies and instruments, sampling scheme, situation and outlooks studies, analysis templates and reporting formats for each location. About 15 local staff and supervisors were trained and the instruments were pre-tested before the surveys were administered using personal interviews. In addition, in Andhra Pradesh (India), an orientation workshop on baseline and market survey for field investigators was conducted from 5-8 January 2008. On-site training was also given to field investigators from 5-7 January at Mitnala village of Nandyal mandal in Kurnool district.

In ICRISAT-ESA, personnel from local partners were trained in methods for baseline survey design, sampling and good practices in administering survey instruments. About 26 local staff and supervisors were trained and the instruments were pre-tested before the surveys were administered using personal interviews.

Milestone 1.4.2: Two MSc and one Ph.D trained through graduate field research including one female

2 MSc and 1 Ph.D students including one female have registered. In ICRISAT-WCA, Mr Abdoulaye Diarra is admitted at the University of Ouagadougou and will start by end of October 2008 for 18 months training towards the DEA.

Activity 1.5. Coordination

Milestone 1.5.1. Methodology development coordinated across sites and workshops organized in November 2007 and March 2008 to harmonize tools used by national teams

The training programs conducted at Patancheru and Arusha involved sessions on identifying target domains, sampling and survey methods, and schedules for the baseline and market surveys for chickpea, pigeonpea, groundnut, beans, cowpea and soybeans. Appropriate adaptations of the survey instruments and methodologies according to the requirements of the crop and the regions were made. The minimum data sets for the situation and outlook reports for the mandate crops were also identified

In ESA, this started with extensive discussions with various partners, including the project breeders and seed systems specialists, and visits to the project sites to identify the key issues to be captured in the baseline data.

Milestone 15.2: Coordination – including evaluation of results and feedback among project implementers

Several coordination meetings (virtual and actual) involving all scientists from Asia, ESA and WCA were conducted during the last one year. In addition, electronic discussions and travel to project sites have been undertaken.

Country level project meetings and training programs complemented the regional stakeholders' inception workshop organized in ICRISAT, Patancheru (India) in Sep 2007, and Arusha, Tanzania in November 2007. Workplans were prepared in consultation with partners and orientation of partners included the definition of roles and responsibilities of each partner as well as the harmonization of socio-economic approaches and methodologies.

- **Management updates**

Questionnaires for targeted legume were built together for more effectiveness. Moreover, target regions were mixed and a generic questionnaire was drawn for all regions. Those questionnaires will be adapted for more appropriateness.

- **Lessons learned**

- a. Multidisciplinary work has been a rewarding experience among biological and social scientists. This has been quite successful especially during the planning stage of the first year. This included the identification of survey and specific locations based on experiences and previous research for development work. Key informant interviews complemented the targeting and prioritization of key variables for the surveys, identification of technologies and institutional arrangements for target groups.
- b. Training and sustained interaction among partners and other stakeholders need to be strengthened for effective delivery of output.
- c. Some control villages were exposed to the seed system intervention. The selection criteria of the counter-factual sites must be reviewed. Appropriate counterfactual based

- on isolation or distance must strictly be followed. The villages exposed to the interventions may have to be classified as “with treatment” in ex-post analysis.
- d. Insights on drought using current questionnaire presents room for improvements for next round of focus group discussions
 - e. Lessons on instruments used: open questions are better in eliciting information on preferences and the ranking procedure needs to be clarified
 - f. Data entry modules for both baseline and market surveys in CSpro-2.6 format were developed by ICRISAT team. These were shared to all partners in collaborating universities for their use in entering the field data. However, the low success rate of the use of CSpro indicates the need for additional exposure and training by the users. This is one activity that needs follow-up for successful implementation.
 - g. In Ethiopia, the seed distribution for beans under the project covered all *weredas* and almost all *kebeles* (villages) within each *wereda* were exposed to the seed system intervention. As such, it was practically difficult to get the community for the counterfactual analysis during impact assessment that meets the criteria as required by the project. Consequently, the selection criteria of the counterfactual site were modified. A village with no intervention but within a *wereda* that has received intervention but 100 km away from the *wereda* selected for PVS was chosen. Therefore, it is anticipated that the methodology for measuring project impact in Ethiopia may also need to change.
 - h. Bean seed systems are largely informal and context specific, meaning that the important variables to measure in our baseline may be unique at least for each region. As a result, baseline on bean seed system will require more time than is currently stipulated in the work plan.

Changes

No major changes in the outputs except the combination of baseline and seed systems surveys at the farm level.

Constraints faced

Mali is waiting for the second disbursement to start the second phase of the baseline. Then they will carry out the survey in the Kayes region. Overall the Mali team is claiming that the budget was very small to undertake the socio-economic activities.

Annexure 1: **Details of the sampling scheme for chickpea, groundnut and pigeonpea in four states of India.**

The details of selected districts, talukas and both control and treatment villages for baseline surveys for the target crops in India are presented in the following table.

Table. Survey districts and villages by crop in India in Tropical Legumes II project.

Crop	State	District	Treatment village	Control village
Chickpea	Andhra Pradesh	Kurnool	Pulimaddi	Brahamanapalli
			Mitnala	Balapanoor
			Munagala	Rasulpet
		Prakasam	Chirakurapadu	Payidipadu
			Kollavaripalem	Bodavada
			Chirvanauppalapadu	Maddirala
	Karnataka	Dharwad	Harobelawadi	Kabbenur
			Shirkol	Hansi
			Kumaragoppa	Yemnur
		Gulbarga	Kurikota	Bhushangi
			Farhatabad	Honnakirangi
			Gotur	Bennur
Groundnut	Karnataka	Raichur	Maragantanala	Adavibhavi
			Boomanagunda	Singeridoddi
			Chandrabanda	Nagandoddi
		Chitradurga	Kaparahalli	Chikkenahalli
			Gulya	Hosahalli
			Konadalahalli	Mogalahalli
	Tamil Nadu	Thiruvannamalai	Melchettipattu	Nachinendal
			Sirunathur	Naarimangalam
			Keelsirupakkam	Radhapuram
		Erode	Bramadesam	Vembatti
			Ulagadam	Odapalayam
			Nambiyur	Emmamboondi
Pigeonpea	Andhra Pradesh	Ranga Reddy	Parvathapally	Domarched
			Old Tandur	Mitta Baspally
		Mahabubnagar	Kodangal	Husnabad
	Maharashtra	Akola	Agar	Ugwa
			Sirso	Jitapur
			Kanzara	Kinkheda

Appendix A - Objectives and Outcomes

Milestone: ID number and brief description	Output since the last report	Person responsible	"On Track" or "Completed" On Track with Challenges Challenges and Delayed	Location of supporting documentation for completed milestones†
<p>Milestone 1.1.1: Standardized baseline survey instruments and methods</p>	<ol style="list-style-type: none"> 1. Compiling, analysis and synthesis of existing information of studies and instruments for the baseline studies 2. 3 Standardized survey instruments developed for targeted legume crops in target countries 	<p>MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao</p>	<p>On track: completed</p>	<p>Tour Reports Documentation of Survey Instruments PRONAF reports in West Africa countries, FIDAFRIQUE website Reports from IITA, ICRISAT, AATF, CIAT and NARS from targeted countries</p>
<p>Milestone 1.1.2: Regional situation and outlook reports for targeted legumes in targeted regions</p>	<ol style="list-style-type: none"> 1. General review on chickpea, pigeonpea, groundnut, cowpea, soybeans and beans production in WCA, ESA and Asia 2. Analysis of constraints and opportunities, strength and weakness linked to the production systems 	<p>MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao</p>	<p>On track</p>	<p>Consultancy reports</p>
<p>Milestone 1.1.3: Baseline socioeconomic database from stratified farm household samples in selected target locations</p>	<p>Surveys are being completed at household and community level (yet to commence are three surveys: groundnut survey in Nigeria, one country survey for beans in ESA and one district survey on groundnut in</p>	<p>MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid</p>	<p>On track, due Feb 2009</p>	<p>Database documentation</p>

	Tamil Nadu, India)	Katungi J. Chianu A Farrow PP Rao KPC Rao		
Milestone 1.1.4: Four baseline reports for targeted legumes	Scheduled to commence as soon as data entry and validation is completed	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao	Due Oct 2009	Reports
Milestone 1.2.1: Standardized survey tool on end-user's trait preferences designed and availed for PVS implementation by other scientists in Objectives 2-7	A standardized survey instrument (PVS evaluations form) has been developed and shared among the team and scientists in Objectives 2-7: Discussion of the instrument for improvement, consistency and adaptation	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao	Completed	
Milestone 1.2.2: Joint report on farmer and market-preferred traits reflecting gender dimensions	Joint report due on April 2010 after 2-3 seasons.	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow	Scheduled to commence in 2009	

		PP Rao KPC Rao		
Milestone 1.2.3: Adoption and impact assessment framework developed	Framework incorporated in baseline survey design	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao	On track	
Milestone 1.2.4: Early adoption assessment undertaken only where uptake is significant using one case study per region	Assessment due in 2010	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao	Scheduled to be completed in 2010	
Milestone 1.2.5: Seed market survey tools designed for implementation by scientists in Objective 8 (The work plan of objective 8 targets only groundnut in WCA, beans in ESA, and cowpea)	Assessment due in 2010	N Jupiter O. Coulibaly Arega A. Enid Katungi J. Chianu	On track	
Milestone 1.3.1: Report on legume agro-ecosystems characterization using GIS tools in	Data collection commenced with the leadership of CIAT for beans and report due in 2009	A Farrow Irshad M PierreSibiry Traore O.	Due in June 2009 for beans and Dec 2009 for others	

terms of growing areas, drought and poverty		Coulibaly N Jupiter S. Bekele Arega A. Enid Katungi J. Chianu PP Rao		
Milestone 1.3.2: Report on recommendation domains and strategies for better targeting of vulnerable groups	To be undertaken under the leadership of CIAT (using beans as model for other crops; with report due in Dec 2009)	A Farrow Irshad M PierreSibiry Traore O. Coulibaly N Jupiter S. Bekele Arega A. Enid Katungi J. Chianu PP Rao	Due in Dec 2009 for beans and six months after for others	
Milestone 1.4.1: At least 200 NARS partners trained through 5 short term trainings and 2 workshops	On-going; training workshops conducted as scheduled	MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao	On-track	
Milestone 1.4.2: Two MS and one Ph.D students trained through graduate field research	2 MS and 1 Ph.D students registered including one female	O. Coulibaly N Jupiter R Muthoni Enid Katungi	On-track	
Milestone 1.5.1: Methodology development coordinated across sites and workshops	Harmonization of socio-economic sampling methods, methodologies,	MCS Bantilan O. Coulibaly N Jupiter	On-track	Semi-annual reports Internet communication (mails) among team members

<p>organized in November 2007 and March 2008 to harmonize tools used by national teams</p>	<p>More than 100 NARS scientists capacity development for data collection, data entry, analysis and reporting</p> <p>Exchange of experiences on survey tools for variety traits preferences, value chains analysis and market opportunities for targeted legume crops in target countries</p>	<p>S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao</p>		
<p>Milestone 15.2: Coordination – including evaluation of results and feedback among project implementers</p>	<p>Regional stakeholders’ workshop in ICRISAT Patancheru, Nairobi (Kenya); Ibadan (Nigeria) and for the project inception in Arusha (Tanzania); Coordination through virtual and face-to-face meetings</p>	<p>MCS Bantilan O. Coulibaly N Jupiter S. Bekele Arega A. R Muthoni Enid Katungi J. Chianu A Farrow PP Rao KPC Rao</p>	<p>On-track</p>	<p>Semi-annual reports Co-ordination of reports for Objective 1 Internet communication (mails) among team members</p>

List below all Sub-Grantees and/or Subcontractors who received funds in the last project period:

Name	Total Amount \$U.S.	Duration From/to dates	Grant or contract
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	477000	09/01/2007 – 08/31/2008	Grant
ANGRAU, Hyderabad	9050	09/01/2007 – 08/31/2008	Grant
UAS, Dharwad	9050	09/01/2007 – 08/31/2008	Grant
UAS, Bangalore	3550	09/01/2007 – 08/31/2008	Grant
PDKV, Akola	3550	09/01/2007 – 08/31/2008	Grant
TNAU, Coimbatore	3550	09/01/2007 – 08/31/2008	Grant
ICRISAT-WCA	107000		
IER (Institut d'Economie Rurale)		09/01/2007 – 08/31/2008	Grant
INRAN (Institut National de la Recherche Agronomique du Niger)		09/01/2007 – 08/31/2008	Grant
IAR		09/01/2007 – 08/31/2008	Grant
EUCORD		09/01/2007 – 08/31/2008	Grant
ADPs		09/01/2007 – 08/31/2008	Grant
Alheri		09/01/2007 – 08/31/2008	Grant
AOPP		09/01/2007 – 08/31/2008	Grant
Bayero University		09/01/2007 – 08/31/2008	Grant
ICRISAT-ESA	198000		
EIAR (Ethiopian Institute of Agricultural Research)		09/01/2007 – 08/31/2008	Grant
Ethiopian Seed Enterprise (ESE)		09/01/2007 – 08/31/2008	Grant
Self Help International		09/01/2007 – 08/31/2008	Grant
Catholic Relief Services (CRS)		09/01/2007 – 08/31/2008	Grant

CARE		09/01/2007 – 08/31/2008	Grant
World Vision		09/01/2007 – 08/31/2008	Grant
Several farmers cooperative unions		09/01/2007 – 08/31/2008	Grant
DARTS (Department of Agric Research and Technical Services)		09/01/2007 – 08/31/2008	Grant
NASFAM (National Smallholder Farmers Association of Malawi)		09/01/2007 – 08/31/2008	Grant
DRT (Department of Research and Training)		09/01/2007 – 08/31/2008	Grant
Naliendele Research Institute		09/01/2007 – 08/31/2008	Grant
DCT (Diocese of Central Tanganyika)		09/01/2007 – 08/31/2008	Grant
Ethiopian Institute of Agricultural Research (EIAR);, Self Help, Catholic Relief Services (CRS)		09/01/2007 – 08/31/2008	Grant
Ethiopian Seed Enterprise (ESE)		09/01/2007 – 08/31/2008	Grant
CARE International		09/01/2007 – 08/31/2008	Grant
World Vision		09/01/2007 – 08/31/2008	Grant
Several farmers cooperative unions		09/01/2007 – 08/31/2008	Grant
Kenyan Agricultural Research Institute (KARI)		09/01/2007 – 08/31/2008	Grant
Katumani Seed Unit		09/01/2007 – 08/31/2008	Grant
Lagrotech Seed Company, Catholic Relief Services (CRS)		09/01/2007 – 08/31/2008	Grant
SACRED		09/01/2007 – 08/31/2008	Grant
Church based organizations		09/01/2007 – 08/31/2008	Grant
International Center for Tropical Agriculture (CIAT)	114000		
Ethiopian Institute of Agricultural Research (EIAR)		09/01/2007 – 08/31/2008	Grant
Ethiopian Seed Enterprise (ESE)		09/01/2007 – 08/31/2008	Grant
Self Help International		09/01/2007 –	Grant

		08/31/2008	
Catholic Relief Services (CRS),		09/01/2007 – 08/31/2008	Grant
CARE		09/01/2007 – 08/31/2008	Grant
World Vision		09/01/2007 – 08/31/2008	Grant
Several farmers cooperative unions		09/01/2007 – 08/31/2008	Grant
Kenyan Agricultural Research Institute (KARI)		09/01/2007 – 08/31/2008	Grant
Katumani Seed Unit		09/01/2007 – 08/31/2008	Grant
Lagrotech Seed Company		09/01/2007 – 08/31/2008	Grant
SACRED		09/01/2007 – 08/31/2008	Grant
Church based organizations		09/01/2007 – 08/31/2008	Grant
Catholic Relief Services (CRS)		09/01/2007 – 08/31/2008	Grant
Department of Agricultural Research and Technical Services (DARTS)		09/01/2007 – 08/31/2008	Grant
Evangelical Lutheran Development Programme (ELDP)		09/01/2007 – 08/31/2008	Grant
Concern World Wide		09/01/2007 – 08/31/2008	Grant
Plan International		09/01/2007 – 08/31/2008	Grant
CARE		09/01/2007 – 08/31/2008	Grant
Action Aid Malawi		09/01/2007 – 08/31/2008	Grant
Concern Universal		09/01/2007 – 08/31/2008	Grant
Small Holders' Coffee Trust		09/01/2007 – 08/31/2008	Grant
Department of Research and development (DRD)		09/01/2007 – 08/31/2008	Grant
Arusha Foundation seed Farm		09/01/2007 – 08/31/2008	Grant
East Africa Seed Company		09/01/2007 – 08/31/2008	Grant
Dodoma Transport Companies		09/01/2007 –	Grant

		08/31/2008	
SARI		09/01/2007 – 08/31/2008	Grant
FARM Africa		09/01/2007 – 08/31/2008	Grant
World Vision		09/01/2007 – 08/31/2008	Grant
ADRA		09/01/2007 – 08/31/2008	Grant
Agricultural Research and Extension (AREX)		09/01/2007 – 08/31/2008	Grant
International Institute of Tropical Agriculture (IITA)	167000	09/01/2007 – 08/31/2008	Grant
Institute of Rural Economy, Mali (IER)		09/01/2007 – 08/31/2008	Grant
Institut National de la Recherches Agronomiques du Niger (INRAN)		09/01/2007 – 08/31/2008	Grant
Kano State Agricultural and Rural Development Authority (KNARDA)			
Kaduna State Agricultural a Development Project (KADP)			
BORNO State Agricultural Development Program (BOSADP)			
Institute for Agricultural Research (IAR), Nigeria			
Instituto de Investigacao Agraria de Mocambique (IIAM)		09/01/2007 – 08/31/2008	Grant
Sokoine University of Agriculture , Tanzania		09/01/2007 – 08/31/2008	Grant
Department of Agricultural Research Services, Malawi (DARS)		09/01/2007 – 08/31/2008	Grant