

About Tropical Legumes III project

Tropical Legumes project is a 10 year vision funded by the Bill & Melinda Gates foundation and jointly implemented by ICRISAT, International Center for Tropical Agriculture (CIAT), International Institute of Tropical Agriculture (IITA) and National Agricultural Research Systems (NARS) of the target countries in sub-Saharan Africa (SSA) and South Asia (SA). Tropical Legumes III (TL III) which is the third phase of the Tropical Legumes project seeks to improve the lives of smallholder farmers in the target region through enhanced grain legume productivity and production.

Executive summary

TL III convenes its annual meeting alongside the Pan African Grain Legumes and World Cowpea Conference

Grain legumes are a key source of nitrogen-rich edible seeds, providing a wide variety of high-protein products and constituting a major source of dietary protein in the diets of the poor in most parts of SSA. Their ability to fix atmospheric nitrogen makes legumes excellent components within the various farming systems. Against this backdrop most developmental partners (including ICRISAT) are pushing the legume agenda forward. The TL III project, lead by ICRISAT, is built directly upon the outputs and momentum of Tropical Legumes I (TL I) and Tropical Legumes II (TL II) projects, but is strategically focused on fewer legumes (chickpea, cowpea, common bean and groundnut) and fewer geographies (Burkina Faso, Ghana, Mali, Nigeria, Ethiopia, Tanzania, Uganda and India's Uttar Pradesh). With the focus on firming up country work plans, the TL III community convened its first annual meeting at a very opportune time alongside the

Pan African Grain Legumes and World Cowpea Conference [one of the signature events of 2016 International Year of Pulses (declared by the 68th UN General Assembly as “[International Year of Pulses](#)”)], during 28 February - 4 March, 2016. The conference was held under the theme “Sustainable grain legume systems for food, income and nutrition security in a rapidly changing environment” and thereafter TL III annual meeting provided a platform for all project implementers’ to review the progress made under TL III and the way forward to ensure the project achieves its desired goal.

At the close of the two events, the following outputs were achieved:

- The importance of grain legumes to food security, child health, environmental sustainability, economic welfare and livelihood of smallholder farmers in Africa was articulated.
- Partners reviewed the 2015-16 project progress and planned the 2016-17 activities for all implementing countries.
- Adoption Seed Road Maps for improved varieties of the crops in each country, were reviewed and endorsed.
- Partners reviewed the project results framework and result tracker and finalized the Monitoring Learning and Evaluation (MLE) Plan.

Introduction

Leading Grain Legumes Scientists, from CGIAR centers including ICRISAT, had an opportunity to participate in the “Pan Africa Grain Legumes & World Cowpea Conference” from 28 Feb - 4 March, 2016 in Livingstone Zambia. The conference, held under the theme “Sustainable grain legume systems for food, income and nutrition security in a rapidly changing environment”, was organized and hosted by IITA, Feed-the-Future Innovation Lab for Collaborative Research on Grain Legumes (Legume Innovation Lab) and CIAT. Co-hosts for the conference were: Zambia Ministry of Agriculture and Livestock (MAL), Zambia Agriculture Research Institute (ZARI), Center for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA), Pan-Africa Bean Research Alliance (PABRA), ICRISAT, CGIAR Research Program on Grain Legumes, Putting



Dr Bergvinson with other dignitaries on the dais.

Nitrogen Fixation to Work for Smallholder Farmers in Africa (N2Africa), Tropical Legumes III Project, Feed-the-Future Innovation Lab for Climate-Resilient Cowpea, Feed-the-Future Innovation Lab for Climate-Resilient Chickpea, University of Zambia (UNZA) and Crop Science Society of America (CSSA).

The conference sought to create synergies and enhance networking and collaboration, in grain legumes research for development.

Thereafter the first TL III annual review and planning meeting was held during 3 - 4 March 2016.

The meeting had three main objectives;

- Provide the TL III scientific community with opportunity to present and refine TL III country work plans along the three broad result areas of gender, breeding and seed systems;
- To understand and finalize the project MLE plans and;
- To finalize the detailed Adoption Seed Roadmap for improved varieties in each country, by crop combination.

The conference and annual meeting featured various parallel sessions of presentation, both oral and posters, exhibitions and break ways.

Opening remarks

Speaking as the honored dignitary at the launch of the conference, Dr David Bergvinson, Director General ICRISAT, highlighted the importance of legume crops for mankind and also ICRISAT's commitment to work with legume crops to contribute towards global food and nutrition security. "With investment in crop improvement and agronomy research, pulses can be made resilient to climate change as well as diversify income sources for farmers. Focused research efforts creating expanded value-added marketplace for pulses, will generate new market opportunities for farmers to

make farmers prosperous, as well as modernize our food systems to become more sustainable, equitable and nutritious," said Dr Bergvinson.

Mr Given Lubinda, Honorable Minister of Agriculture, Zambia, underscored the importance of legume crops in achieving global food and nutrition security. Bringing this to the notice of the global community was also recognized and embraced by Mr Lubinda. The minister also assured the participants that his government is determined to make Zambia the food basket of the region and therefore contribute significantly to the global food supply chain. He urged African countries to move ahead of the traditional farming and promote mechanized and climate smart agriculture as well as take advantage of the digital or ICT solutions to enhance crop production. Later, Mr Given Lubinda visited the ICRISAT exhibition booth, to learn about the technology developed under the TL III project.

Conference presentations

Dr Rajeev K Varshney, Research Program Director - Genetic Gains and Principal Investigator, TL III, ICRISAT, speaking about "Enhancing genetic gains in chickpea breeding in marginal environment in Africa and South Asia", highlighted ICRISAT's research on Grain Legumes and other key initiatives like, "The 3,000 chickpea genome sequencing initiative", an international effort to sequence and phenotype the chickpea global composite collection. Dr Varshney presented the progress on chickpea from a small number of markers, to re-sequencing and molecular breeding, as a result of coordinated efforts of the TL I, TL II and TL III projects.

Dr Emmanuel Monyo, Principal Scientist and Coordinator, TL III, ICRISAT, highlighted the achievements of the Tropical legumes project over the past seven



Mr Given Lubinda, Honorable Minister of Agriculture, Zambia (far right) accompanied by Dr Bergvinson, (third from right) at ICRISAT Exhibition Booth. At the center is Dr Moses Mwale, Director, Zambia Agricultural Research Institute and to the left, Dr Monyo, TL III Coordinator, ICRISAT.



Dr Varshney, making a presentation.

years (Figure 1), and the future intent of the project to impact on the livelihoods of more than 4 million smallholder farmers in SSA and SA.

Dr Jeffrey Ehlers, Program Officer, Bill & Melinda Gates Foundation, highlighted the importance of linking the new varieties development, to seed delivery systems, in order to deliver new technologies to the farmers as soon as they are made available.

Other TL III scientists who presented at the conference were, Dr Ganga Rao, Senior Scientist (Breeding, Grain Legumes), on *R&D efforts in pigeonpea breeding in ESA*; Dr Christopher Ochieng Ojiewo, Senior Scientist - Legumes Breeding, Grain Legumes, on *Advances in chickpea breeding in ESA: Current status and emerging issues*; Dr Pooran Gaur, Assistant Research Program Director - Grain Legumes, on *Tailoring chickpea varieties for amenability to machine harvesting*; Dr Olusoji Olufajo, on *Enhancing release and dissemination of improved cowpea varieties*; Dr Papia Binagwa, on *Capacity building of farmer groups in quality seed production*; Dr Paul Aseete, on *Influence of group factors on women empowerment in collective action: Case of bean production in Central Uganda*; Dr Benoit Joseph, on *Marker assisted backcrossing to improve cowpea for drought tolerance*; Dr Enid Katungi, on *Estimating common bean consumption demand in Uganda*; Dr Ousmane Boukar, on *Development and dissemination of drought tolerant cowpea varieties in sub-Saharan Africa*, etc.

Four posters presented by TL III scientists team, at the poster sessions were on:

- i. An Overview of Chickpea Improvement Program of Ethiopia
- ii. Innovative Chickpea Seed and Technology Delivery Systems in Eastern and Southern Africa (ESA)
- iii. Overview of Tropical Legumes Projects (TL-I, TL-II, TL-III) - the Chickpea Scenario in Ethiopia, and
- iv. Success of Chickpea Production in North Gondar Zone of Ethiopia

Meeting proceedings

The two days meeting was attended by around 50 participants from partner institutes including CIAT, IITA, ICRISAT scientists from India and Africa locations and key representatives from NARS partners from SA and Africa. The meeting was categorized into five sessions:

Section 1

During the inaugural address, Dr Bergvinson said, “Focus on farmers, lasting capacities and honor for the urgency is our main focus”. He also highlighted the need to leverage on the potential of ICT’s to connect farmers with market and empower them with more informed and profitable farming practices.

Dr Ehlers, emphasized on the need to understand the current status, identify gaps and move forward more collectively in order to achieve the objectives of TL III.

Other speakers during the session were; Dr Varshney, who shared his experience as Principal Investigator, TL III; Dr Monyo, who outlined the objectives and expectations of the meeting; Dr Omari Mponda, Zonal Director for Research, Southern

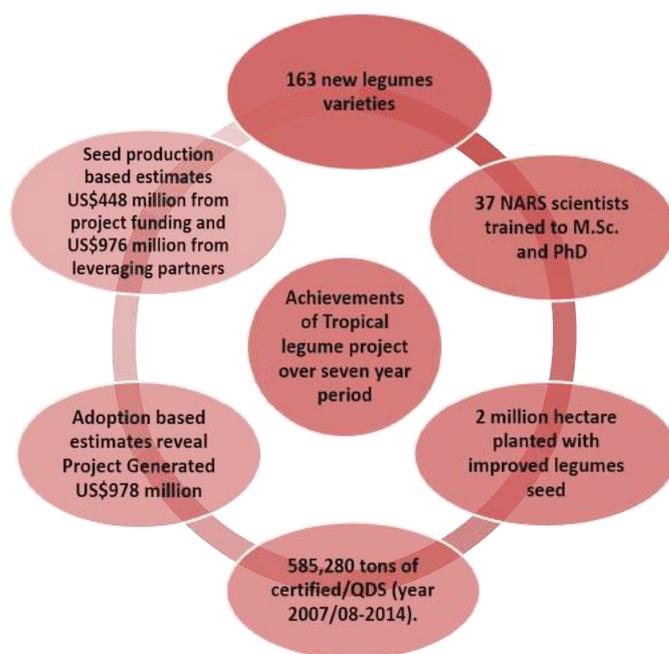


Figure 1. Achievements of Tropical legumes project over seven year period



Participants at Tropical Legumes III annual meeting in Livingstone, Zambia.

Tanzania; Dr Robin Buruchara, Director, CIAT Africa and Dr David Chikoye, Director, IITA ESA Region, highlighted the perspectives of the NARS partners, CIAT and IITA respectively.

Section 2

The session on Elaboration of detailed Country Workplans, was chaired by Dr Varshney, and offered various countries the opportunity to review the 2015-16 project progress and 2016-17 planned activities for each implementing country.

Section 3

The Measurement Learning and Evaluation (MLE) session, was divided into two parts, plenary presentations and breakout groups by theme. During the plenary, the following presentations were made;

TL III data management plan, Dr Abhishek Rathore; Status and discussion on Integration of ICT's in TL III, Mr Nilesh Mishra and The TL III Global Measurement Framework, Dr Kai Mausch. The group work structure was around the following themes, a) Gender adoption and impact b) Breeding and genetic gain, and c) Seed systems. Later, the group rapporteurs presented the MLE plenary report from the working groups.

Section 4

The Seed production and adoption roadmap session, was chaired by Dr Ehlers and comprised of a presentation by Dr Rubyogo JC, CIAT, on TL III seed production/adoption targets and strategies for their attainment, followed by a discussion on the same topic, and later a plenary report from the seed production and adoption roadmap for each country was presented.

Section 5

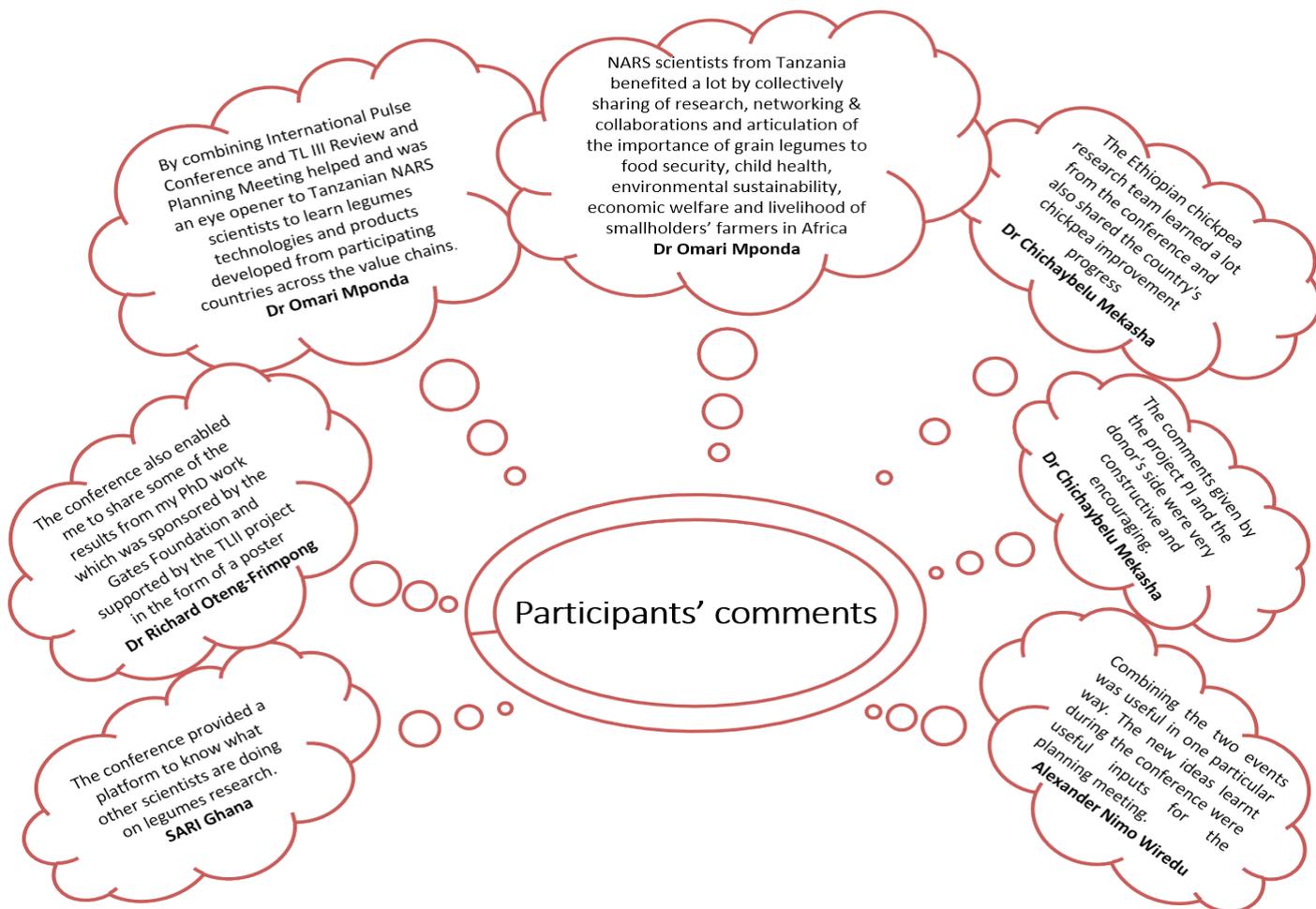
Closing remarks by Dr Olusoji Olufajo, NARS representative, appreciated the efforts of ICRISAT, CIAT, IITA and especially the Bill & Melinda Gates Foundation, who are supporting the TL III project to strengthen the capacities of NARS partners and in turn help the smallholder farmers in South Asia and Africa to achieve food and nutritional security.

Dr Ehlers, commended ICRISAT for its leadership in the project and urged all partners to take this project as an opportunity to strengthen their skills and build their capacities so they become self-sufficient and sustainable, in addressing the challenges and issues in legumes crops in their region and build a better food secure future.



Participants during group discussions at TL-III annual meeting.

Voices from partners and partner institutions



Case study of Kilindi district, Tanga

Capacity building of farmer groups for good quality seed production to accelerate adoption of improved bean varieties in northern zone of Tanzania

In Tanzania, the access and use of certified seed of beans, by farmers, remains unsatisfactory and 90% of the seeds used for planting, are farm saved seeds which are highly susceptible to soil borne pathogens, hence leading to low yield. In response to this weakness in seed systems, Tanzania adopted the decentralized seed schemes such as, Quality Declared Seed (QDS) or standard seed grades, aiming at improving the availability of quality seed at local level. The government of Tanzania in collaboration with various international partners, has taken several initiatives to strengthen the national bean seed program. Stakeholders meetings were conducted, followed by farmers' training on seed production. Sites for conducting demonstrations of improved bean technologies for quality declared seeds were selected in seven villages and in each village, six improved bean varieties and local landraces were planted. Farmers managed these demonstration sites in collaboration with the extension officers. Field inspections were conducted often, so that farmers could meet seed standards set by quality seed authorizing institute. In order to enhance the adoption, field days were conducted at maturity stage of the crop, in one of the demo plots. Out of 42 farmers who participated in the training on quality declared seed production, merely 18 farmers agreed to participate fully for QDS production and 8 ha were identified for seed production. Due to weather change, 4.8 ha were planted and 4,850 kg of quality declared seeds produced. Through popularizing bean varieties, 253 bean stakeholders including farmers participated in the field day. This QDS approach has been an advantage to increase the access of quality common bean seeds to smallholders' farmers in the rural areas.

Contributor:

Papias Binagwa – Common bean focal point, Tanzania

Case study from Nigeria

Enhancing the release and dissemination of improved drought tolerant cowpea varieties in Nigeria

Cowpea (*Vigna unguiculata* (L.) Walp) is the most important food legume in West and Central Africa, where it serves as a source of vegetable protein and livestock fodder, as well as a major contributor to the improvement and maintenance of soil fertility. Cowpea production in Nigeria takes place mainly in the dry savanna region. With the present climate change challenges, the importance of cowpea will increase significantly in this region, where water-deficit stress, poor soil fertility and parasitic weeds attack, are frequently observed. In Nigeria, the demand for cowpea is very high and an annual deficit of 0.5 million tons has recently been projected (Abate et al. 2012). In order to address the numerous constraints militating against cowpea production, lines adapted to most of the production regions have been developed. A present paper presents the results of a multi-location and on-farm experiments leading to the release of two high performing cowpea lines (IT07K-318-33 and IT07K-292-10) that are tolerant to drought and striga/alecra.

Grain yields of IT07K-318-33 in multi-location trials, ranged from 616 – 2,067 kg ha⁻¹, with a mean yield of 1,373 kg ha⁻¹, while those of IT07K-292-10 varied from 305 – 2,182 kg ha⁻¹ with a mean of 1,347 kg ha⁻¹. Both lines matured in about 76 days, which makes them early maturing lines. In participatory on-farm trials, IT07K-292-10 and IT07K-318-33 out-performed the farmers' variety by 119.2% and 142.5%, respectively. Farmers showed preference to both varieties and ranked them highly, due to their early maturity, high yield, drought tolerance, high market value and good fodder quality.

Based on the results of the multi-location and on-farm trials, as well as end of season evaluation at the different locations, IT07K-292-10 and IT07K-318-33 were found superior to the local improved released and improved breeding lines tested. Apart from being high-yielding, the two varieties are tolerant to drought and Striga, which are major constraints to cowpea production in the dry savanna. Moreover, both varieties have combined resistance to most of the common diseases. While IT07K-292-10 (SAMPEA 16) is white seeded, IT07K-318-33 (SAMPEA 17) is brown seeded, thereby providing choice to both farmers and consumers. The two varieties were approved for registration and release by the Nigerian Crop Varieties and Livestock Breeds Registration and Release Committee in June 2015, as it was obvious that farmers would be willing to adopt them. This committee is ensuring the availability of improved varieties to farmers, thus addressing issues of food security, increased productivity and income. Breeder seed of these cultivars is being maintained at IITA as well as the Institute for Agricultural Research of Ahmadu Bello University, Zaria-Nigeria.

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For conference & annual meeting photographs,
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