

## About the bulletin

The Bulletin of Tropical Legumes is a quarterly publication of the Tropical Legumes III (TL-III) project, funded by the Bill & Melinda Gates Foundation, and jointly implemented by the International Crops Research Institute in the Semi-Arid Tropics (ICRISAT), the International Center for Tropical Agriculture (CIAT) and the International Institute of Tropical Agriculture (IITA) in close collaboration with partners in the National Agricultural Research Systems (NARS) of the target countries in sub-Saharan Africa and South Asia. TL-III aims to improve the livelihoods of smallholder farmers in drought-prone areas of the two regions through enhancing grain legumes productivity and production.

## Tropical Legumes III Launched Executive Summary

Legumes play an important role in soil fertility enhancement and human nutrition. In the tropical areas of the world, legumes are important crops for addressing the challenges of food security and poverty reduction. However, most governments do not give considerable attention to the development of legumes in their investment priorities. Against this backdrop, recent efforts have been made by research institutes and development partners to move the legumes agenda into the limelight of country agriculture development plans.

Since 2007, ICRISAT and its partners have implemented two phases of tropical legumes (TL) project, TL-I and TL-II. In order to sustain the gains made from the first two phases, TL-III project was formulated. The project will be implemented in seven African countries (Ethiopia, Tanzania, Uganda, Burkina Faso, Ghana, Mali and Nigeria) and India.

A multi-stakeholder workshop was convened to launch TL-III project on 18-19 August 2015. The launch was attended by scientists from the three CGIAR centres that are partnering in the

implementation i.e. International Center for Tropical Agriculture (CIAT), ICRISAT and International Institute for Tropical Agriculture (IITA); along with scientists from the National Agricultural Research Systems (NARS) in the focus countries and; the development partners.

The workshop process was facilitated by the Institute for People, Innovation and Change in Organizations-Eastern Africa (PICO-EA), through a participatory, flexible approach involving input presentations, group discussions and plenary sessions. At close of the workshop, the following key outputs were achieved:

- Better understanding of the project context and objectives
- Increased understanding of TL-III's interface with respective country legumes strategies
- A sense of ownership of the TL-III project
- Country draft work plans integrating TL-III objectives.

In the closing session, important observations made included:

- The value added by TL-III to national priorities was identified: As TL-III was congruent with the country legume strategic plans, it would add value to what individual countries were already planning on doing as part of the national priorities.
- The workshop enabled participants to harmonize the TL-III focus and context.
- Participants were urged to fulfil the promises made through the work plans to demonstrate total ownership and ensure proper accountability to the people and the government in their countries.
- The need to integrate youth in the implementation of TL-III to harness their skills and energy in positive ventures was emphasized.
- The role of emerging partnerships in supporting NARS was noted.
- The need to align the work plans with the CAADP-Comprehensive African Agriculture Development Program (Maputo and Malabo commitments) was emphasized.

It was agreed that implementation of TL-III should build on lessons and synergies from TL-I and TL-II projects. In order to provide a clear roadmap for the implementation process, draft country work plans were developed. Country teams were expected to refine and finalize their draft work plans by incorporating further insights from the subsequent sessions on monitoring and evaluation on 20-21 August 2015 as well as in-country consultations, within two months of the project launch.

## 1. Introduction

### 1.1 Overview

The TL-III project titled *'Improving livelihoods for smallholder farmers: Enhanced grain legume productivity and production in sub-Saharan Africa and South Asia'* is being implemented across the eight countries, Ethiopia, Tanzania, Uganda, Burkina Faso, Ghana, Mali, Nigeria and India. The project's overall goal is to develop and disseminate improved legume varieties and is organized into seven objectives.

- i. Leverage gender and learning to maximize impacts on poverty and food security of smallholder farmers.
- ii. Enhance groundnut productivity and production in focus geographies of sub-Saharan Africa (SSA).
- iii. Enhance cowpea productivity and production in focus geographies of SSA.
- iv. Enhance common bean productivity and production in focus geographies of SSA.
- v. Enhance chickpea productivity and production in focus geographies of SSA and South Asia (SA).
- vi. Develop sustainable and impact oriented legume seed systems for smallholders in SSA and SA.
- vii. Project oversight and management to implement results based management approaches to assure accountability, learning and scalability.

Each objective has a objective leader to plan and implement activities under the specific objective.

### 1.2 Workshop objectives and expected outcomes

The key objectives of the workshop were to:

- Launch of the Tropical Legumes (TL-III) Project
- Develop detailed country specific work plans for 2015-16 that are in resonance with country legumes strategies

The following outcomes were expected from the workshop:

- i. Enhanced understanding of TL-III objectives
- ii. Increased understanding of TL-III interface with respective country legumes strategies
- iii. TL-III country specific work plans developed

## 2. Opening Remarks

In this session Dr Emmanuel Monyo, (Coordinator, TL-III project) called upon representatives of various partner organizations to make brief opening remarks.

Dr Moses Siambi, (Regional Director, Eastern and Southern Africa, ICRISAT), officially welcomed the participants and expressed his pleasure that participants met the 30% gender representation. Dr Siambi thanked the project leaders, donors, researchers and all participants for sparing time to participate in the meeting. He emphasized the need for researchers to



Opening session.

recognize the health benefits of legumes and promote legumes so that as the incomes rise, consumption of legumes increase instead of peoples diet shifting to livestock products.

Dr Peter Carberry, Deputy Director General-Research, ICRISAT, acknowledged the support from Bill & Melinda Gates Foundation and other donors. He emphasized the key lessons from research and development work as:

- Need to develop talent for performance and productivity.
- Importance of nutrition.
- Importance of crop improvement through innovations focusing on adapting varieties to local farmers' contexts.
- Get improved varieties to farmers' fields through systems thinking that includes markets and risk management.
- Understand the role of, and target gender and youth.
- Importance of partnerships in research and development-ICRISAT with NARS, CGIAR centers and other actors.
- Build synergies with country strategies.
- Need for continual and increased innovation in order to create greater impacts.

Dr Robin Buruchara, RD–Africa, CIAT, thanked the workshop organizers and participants for taking time to develop project proposal and for arranging the meeting. He asked participants to focus on creating value that will make TL-III different and a significant undertaking. He asked them to consider two questions during the workshop's deliberations:

- What new ideas/products is the project going to generate to benefit our local communities?
- In terms of nutrition and food security, what is the project's contribution to the livelihoods, incomes and nutrition of those whom it seeks to serve?

Dr Buruchara asked participants to use their diverse skills and experiences to achieve greater impacts and synergies for progress. Finally, he expressed commitment from CIAT in building partnerships that help to achieve the project objectives.

Dr Christian Fatokun, IITA, reinforced IITA's commitment to TL-III and highlighted the organizations research work in legumes (soybean and cowpea). He thanked the Bill & Melinda Gates Foundation for supporting legume productivity and technology dissemination work in TL-I and TL-II and for bringing together the CGIAR centers, to address the legumes issues. Dr Fatokun informed participants that as the United Nations has declared the year 2016 as the International Year of Pulses, IITA will contribute to the International Year of Pulses by holding the Pan Africa Legume Policy Conference in February 2016 in Zambia.

Dr Bouréma Dembélé, Director General, Institut d'Economie Rurale (IER), Mali, on behalf of the NARS thanked ICRISAT for the collaboration in TL-III. He hoped that TL-III will contribute to improving farmers' livelihoods and guaranteed NARS support in meeting the project objectives.

Dr Jeff Ehlers, Program Officer, Bill & Melinda Gates Foundation mentioned that the TL-III project is considered by the Foundation as a major flagship investment in legumes. He noted that as a continuation of TL-I and TL-II, the TL-III Project represents a more focused and integrated phase to realize the 10 year vision, developed in 2007, to increase legume production across sub-Saharan Africa by 20%. He observed the key achievements of TL-I and TL-II as:

- TL-I headed by the Generation Challenge Program (GCP) at the International Center for Maize and Wheat Improvement (CIMMYT) and involving ICRISAT (chickpea and groundnut), CIAT (bean), and the University of California-Riverside (cowpea), developed genomic resource for modern breeding of these crops, including high-throughput genotyping platforms, and genetic markers for key disease resistance traits and drought tolerance.
- TL-II project led by ICRISAT with CIAT and IITA, developed seed platforms that helped produce and disseminate some 600,000 tons of seeds of the improved legume varieties.
- Both TL-I and TL-II succeeded in getting over 150 varieties released due to efforts in 'unlocking' the build-up of varieties in national breeding programs.

Dr Ehlers indicated that TL-III project represents an opportunity to substantially impact the more problematic crop-geography combinations by focusing greater resources on fewer partners and crops compared to the resource distribution in TL-II. He singled out the unique opportunity to partner with two new United States Agency for International Development (USAID) Cowpea and Groundnut Seed Scaling Projects that overlap greatly with TL-II crops and countries. He affirmed the commitment of the Bill & Melinda Gates Foundation's under TL-III, to the use of

improved sampling and DNA fingerprinting approaches to get a better estimate of work being done. Dr Ehlers pointed out the main pillars in focus under TL-III as:

*i) Support existing CGIAR and NARS breeding programs*

- TL-III has a narrower crop and geographic focus and will put much more emphasis on improving breeding program performance. Specifically, TL-III will concentrate its efforts on cowpea and groundnut in Burkina Faso, Ghana, Mali and Nigeria; common bean and chickpea in Ethiopia; common bean and groundnut in Uganda and Tanzania and; chickpea in Uttar Pradesh, India. This represents a reduction in the number of crop-geography combinations from 45 to 15 and will allow more focused and better funded efforts with higher impact for the crop-country programs. This is expected to improve monitoring of project progress.
- Priorities for each breeding program will be largely aligned to national priorities as detailed in the Country Strategies and Seed Roadmaps publication of TL-II. Varieties will be bred to have nutritional content, cooking quality and market acceptability at least as good as existing dominant varieties.

*ii) Improve breeding program efficiency/processes*

- TL-III breeding programs will be substantially improved so that they achieve higher genetic gains by each of them undergoing a formal diagnostic and improvement process.
- Modern plant breeding technologies (such as marker-assisted breeding using resources developed in the TL-I project) will be fully integrated into the workflow of the programs.

*iii) Seed delivery*

- This pillar aims to enable the sustainable delivery of improved seed of each crop in each focus geography sufficient to meet the equivalent of at least 20% of annual requirement. To track and help achieve this, detailed seed production plans and planning processes were developed under the TL-II project for each partner country to ensure appropriate amounts of seed of specific classes (breeder, foundation, certified) of specific varieties is produced for different production regions. This will be continued under TL-III using a Digital Roadmap Seed Planning Tool.
- In geographies where large/comprehensive Bill & Melinda Gates Foundation seed system investments, such as, country level Integrated Seed Sector Development (ISSD) projects are or will be in place (Ghana, Tanzania, Ethiopia), in support of multiple crop seed delivery, there is a need to closely coordinate efforts and take advantage of what each project can offer. In such cases, TL-III will focus its efforts on the upstream portion of seed value chain to help ensure sufficient 'breeder' and 'foundation'

seeds of improved legume varieties is produced to meet the needs of the seed delivery pipelines of these projects. Seed dissemination targets for these geographies will be adjusted upwards once the locations, timings and scope of these pending investments are known.

- Where such comprehensive seed sector investments are lacking, the project will work by significantly scaling-up seed delivery efforts ongoing under TL-II.
- The TL-III project has been designed with a particular emphasis on benefiting women farmers. The project will hire an international gender specialist whose role will be to design and implement activities that help women smallholders benefit through the project. Specific actions the gender specialist undertakes will include ensuring that the variety characteristics desired by female smallholders in various production geographies are sufficiently prioritized during the varietal concept and development phase. The project will also design and implement activities to improve access of improved variety seeds and grain legume business opportunities to women.

#### iv) NARS capacity building

- Focus is to build capacity of partner NARS in breeding aspects by training at least four PhD and four MSc students, with at least 50% female students.

### 3. Workshop processes and expectations

By the end of the workshop, participants should have -

- Clear understanding of TL-III activities and objectives.
- Clarity on strategies for implementing activities.
- Developed the annual country work plans.
- Clear role of each participant.
- Elaborate understanding on how TL-III will interface with country work plans.
- Understanding of the seed delivery systems.
- Enhanced networking and partnerships.

### 4. Scene setting

This session covered presentations on the context, objectives and data management of TL-III project followed by a plenary discussions.



*An objective leader explaining the activities to be undertaken.*

### 4.1 Presentation on TL-III project overview

In his brief presentation, Dr Emmanuel explained that TL-III is a major international initiative partnering ICRISAT, CIAT, IITA, and eight NARS institutes to:

- Develop improved cultivars of common bean, cowpea, chickpea and groundnut.
- Deliver seed at scale to smallholders in the identified geographies.
- Fundamentally strengthen NARS and CGIAR breeding programs and seed platforms.

#### The project goal and target:

- To specifically support the breeding pipelines of Africa based breeding programs (cowpea, beans, groundnut, and chickpea) and chickpea varietal development in Uttar Pradesh.
- To reach at least four million smallholders with seed of targeted varieties over the course of the project.

The CGIAR and NARS programs will operate as equal partners in a networked fashion. The TL-III Project objectives and activities were discussed.

### 4.2 Presentation of project objectives and plenary feedback

The objective leaders presented pertinent information on what each objective seeks to achieve and the activities that need to be undertaken. Brief plenary discussions clarified each objective and raised issues that needed to be considered to effectively implement each project objective.

The key points noted from the presentations and the emerging issues highlighted in the plenary discussions are summarized in Table 1.

### 4.3 TL-III project data management

The presentation focused on how data will be managed in TL-III project. It was noted that data management goes beyond archiving and sharing to include generating good data, analyzing and sharing it. Participants agreed that:



*Dr Monyo explaining the importance of country legumes strategic plans.*

- A centrally managed crop database will be established.
- Breeding management systems training will be offered to those involved in project implementation.
- Cloud-based data platform will be used due to its security and easy accessibility to all partners.
- Partners will be able to upload their data and photographs.
- Data analysis to be done before meetings to enable sharing.
- Online sharing of published data will be made possible after approval by project principal investigators considering institutional policies.
- Since TL-III is a joint project of ICRISAT, IITA, CIAT and NARS, each of these institutions will contribute data as partners and each can access the data beyond the project closure.

**Table 1. Emerging issues from project objectives - Presentations.**

Objective	Key activities	Emerging Issues from Plenary
1	<ul style="list-style-type: none"> <li>▪ Ensure that TL-III gender goals are fully established and achieved throughout objectives 2 to 7.</li> <li>▪ Develop a robust monitoring, learning and evaluation (MLE) system that incorporates use of DNA fingerprinting to monitor adoption, harmonize ex post impact assessment and provide timely reports on ex post impact assessment of NARS-improved legume varieties.</li> <li>▪ Design, test and deploy innovative gender empowerment strategies to enhance legume production among under-producing households.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Need to revisit and harmonize technologies that have worked well before to achieve spill over across time and space.</li> <li>▪ Include data on socio-demographics and agricultural trends showing effect of declining land sizes.</li> </ul>
2		<ul style="list-style-type: none"> <li>▪ Varietal attributes such as cooking time are important in selection.</li> <li>▪ A combination of approaches for nitrogen enhancement should be considered.</li> </ul>
3	<ul style="list-style-type: none"> <li>▪ Trait discovery pipeline</li> <li>▪ Breeding pipeline</li> </ul>	<ul style="list-style-type: none"> <li>▪ Multi-disciplinary scientists are needed to implement different levels of the objective. Graduate student training is important.</li> </ul>
4	<ul style="list-style-type: none"> <li>▪ Testing for release</li> <li>▪ Best bet varieties</li> <li>▪ Enhancing genetic gain of CIAT, ICRISAT and IITA hubs and their partners</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consider better management practices that will enable high impact from improved varieties.</li> <li>▪ Time between development and release of varieties varies in different countries and depends on many complex situations that need to be looked at.</li> </ul>
5		
6	<ul style="list-style-type: none"> <li>▪ Establish multi-stakeholder platforms across legumes including private sector, value chain service providers and farmer organizations – link up value chain actors and provide training to those who need it.</li> <li>▪ Sustainable production and delivery of various seed classes.</li> <li>▪ Innovative and targeted seed marketing to increase seed availability to women and smallholders – introduce small packs of seed by helping private sector see profits in selling small packs Popularize new varieties.</li> <li>▪ Strengthen multi-legume impact-oriented seed systems (coordination).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mechanisms to sensitize farmers on good quality seeds are important.</li> <li>▪ Incorporate both formal and informal seed systems in the certification process.</li> </ul>
7	<ul style="list-style-type: none"> <li>▪ Efficient project management, reporting and communication of progress.</li> <li>▪ Effective data processing and dissemination.</li> <li>▪ Empowering partners, NARS and stakeholders.</li> </ul>	

## 5. Integrating TL-III into country strategies

### 5.1 Understanding the country legumes strategic plans

The discussion on how to integrate TL-III into the country strategies was initiated by a brief presentation by Dr Monyo that looked at TL-III in relation to the countries' development frameworks. He noted that the country strategies are built on the CAADP framework that embraces the principles of the Declaration on Aid Effectiveness, of which 148 countries, including 38 African countries and all the TL-III countries are signatories. This emphasizes the need to uphold the following key values:

- Country ownership of development policies and strategies.
- Alignment of donors' support with partner countries' strategies and policies.
- Harmonization of donor approaches to avoid duplication of effort.
- Managing results.
- Mutual accountability for development results.

Dr Monyo informed participants that as part of the tropical legumes development process, the country focal points were requested to highlight legumes priorities within their respective country's Agriculture Development Framework. These country legume priorities and Seed Road maps helped meet TL-II targets. He emphasized that under TL-III, the country teams were expected to re-visit their country's legume priorities and align them with TL-III. The need to harmonize the country legumes priorities with CAADP framework (Maputo as well as Malabo Declaration for the African geographies) was underscored.

This presentation was followed by breakout group discussions on the countries' legume strategic plans, priorities and value addition.

### 5.2 Country legume strategic plans, priorities and value addition

Participants went into country breakout groups and discussed their legume strategic plans. Each country

breakout group discussed and responded to the following aspects:

- 1) What are the key highlights of your country's legume strategic plan?
- 2) What are its key priorities?
- 3) How does TL-III add value?
- 4) Prepare three brief highlights/points on Q3 only (value addition) and report back to the plenary using PowerPoint slides or flipcharts.

The facilitating team, project objective leaders and TL-III partners from CIAT, ICRISAT and IITA joined each group to help clarify points during the group discussions. The main points noted from the plenary session are summarized in Table 2.

Some important observations made from the brief plenary discussion of the country breakout groups' feedback are:

- TL-III objectives correspond to peoples' needs within the countries.
- Each member state re-affirmed that they had a country strategy.
- Evidence of national targets being fulfilled. This confirmed that the process of developing TL-III project was based on useful consultations with relevant stakeholders hence its contents are in line with national priorities.

Having shared insights from the presentations and discussions on TL-III's objectives and specific value addition to countries' legumes strategic plans, the participants were asked to discuss further how the country plans would contribute to achieving the project objectives.

### 5.3 Relating TL-III's objectives to countries

Participants went into breakout groups again to discuss and prepare detailed work plans specifying how each project objective would be achieved. This time, participants were asked to join breakout groups by objective to discuss the following:



*Discussion of objective based activity plan in the breakout groups.*



**Table 2. Country teams' perspectives on TL-III's value addition to national legumes strategies.**

Country	How TL-III adds value to the national legumes strategic plan
India	<ul style="list-style-type: none"><li>▪ Help re-introduce legumes in an area where wheat has replaced it and contribute to meeting the food security and protein requirements in the Indian diets, which is largely vegetarian.</li><li>▪ Help meet food needs for a growing population.</li><li>▪ Fits in ongoing national breeding programs.</li></ul>
Tanzania	<ul style="list-style-type: none"><li>▪ Bring varieties of groundnuts and beans that are drought tolerant and aflatoxin resistant.</li><li>▪ Bring new highly nutritious varieties in the market.</li><li>▪ Strengthen informal seed systems.</li><li>▪ Accelerate adoption of new varieties.</li><li>▪ Increase supply to meet demand.</li><li>▪ Attract private-public partnerships eg, for marketing of seeds.</li><li>▪ Build capacity of scientists.</li></ul>
Nigeria	<ul style="list-style-type: none"><li>▪ Use molecular tools to shorten breeding cycle and efficiency to achieve the target of 10% increase in yield and reduction in aflatoxin contamination.</li><li>▪ Efficient seed delivery systems to enable 20% increase in adoption of improved varieties and gender sensitive crop utilization.</li><li>▪ Promote improved crop management for enhanced legume crop production.</li></ul>
Mali	<ul style="list-style-type: none"><li>▪ Enhancing breeding efficiency in germplasm transfer/exchange, method and skill.</li><li>▪ Improving nutritional quality of Malian food.</li><li>▪ Capacity building (training and infrastructure).</li><li>▪ Improve seed system (production, marketing, platform organized).</li></ul>
Uganda	<ul style="list-style-type: none"><li>▪ Improved varieties for increased productivity.</li><li>▪ Use of new breeding tools to accelerate genetic gains.</li><li>▪ Nutritional content will be enhanced.</li><li>▪ Add value in research data management and capacity building.</li><li>▪ New models to improve seed distribution (small packs, multi-stakeholder platforms).</li></ul>
Burkina Faso	<ul style="list-style-type: none"><li>▪ New varieties for market.</li><li>▪ Control of aflatoxins.</li><li>▪ Good quality seeds to meet local demand and export.</li><li>▪ Better seed availability when seed system is improved.</li><li>▪ Capacity building through studentships.</li><li>▪ Enhancing seed policy.</li></ul>
Ethiopia	<ul style="list-style-type: none"><li>▪ Provides impetus to implement national strategy.</li><li>▪ Use innovative methods (multi-stakeholder platforms, quality assurance) to improve poor smallholder farmers' access to better seed varieties.</li><li>▪ Modernization of breeding system and enhancing genetic gain in legumes: bring 50-60% productivity increment per crop (molecular tools, mechanization, and irrigation).</li><li>▪ Innovative seed system to enhance access of quality seeds to the needy (Multi-stakeholder platform, quality assurance) contribution for increased production up 46% production from the existing production.</li><li>▪ Enhancing the access of demand-driven technologies sensitive to different targets (including diverse categories by gender group, agro-industry, income, export, nutrition).</li></ul>
Ghana	<ul style="list-style-type: none"><li>▪ Enhancing seed availability and popularizing use of available varieties.</li><li>▪ Provides financial leverage to ongoing projects.</li><li>▪ Achieving gender parity in legumes development and research.</li><li>▪ Increased productivity of legumes in Ghana by ensuring that smallholder farmers have access to improved certified seeds.</li><li>▪ Capacity development of researchers and farmers in breeding programs in legumes (markers).</li><li>▪ Improving the livelihood, nutrition and income of smallholder farmers.</li></ul>

- Generic work plan activities to meet targets for 2015-2016 for each objective.
- Consider each country's contribution towards this objective where applicable.
- Report on the key highlights.

The group perspectives were presented and discussed in a plenary. The main points from the breakout objective based groups are shown in Table 3.

**Table 3. Agreed activities for each objective in breakout groups.**

Objective	Key activities/issues to be considered in implementation
1	<ul style="list-style-type: none"> <li>▪ Impact assessment: discussion to be held on methodology by Tanzania, Ethiopia, Ghana and Nigeria.</li> <li>▪ DNA fingerprinting</li> <li>▪ Gender based studies</li> </ul>
2	<ul style="list-style-type: none"> <li>▪ <b>Trait discovery pipeline:</b> Cost effective marker genotyping platform established and used by NARS partners. Genotyping platform for marker development centralized. Marker utilization capacity within NARS built. Phenotyping platform for drought in Tanzania, Ghana, Uganda and for aflatoxin in Nigeria, Burkina Faso, Tanzania, Mali, Ghana and Uganda (done in every country). Identify and evaluate QTLs for tolerance/resistance to select abiotic and biotic stresses in ESA and WCA (centrally coordinated and across 6 countries). Traits need clear identification and background. Collection and phenotyping data using modern tools and platforms of IBP at ICRISAT offices, Mali, Nigeria and Malawi, and partners in Nigeria, Ghana, Burkina Faso, Tanzania, and Mali. Management and sharing of pedigree, genotyping and phenotyping datasets (applies to all participating countries).</li> <li>▪ <b>Breeding pipeline:</b> Develop short duration (SD) breeding lines with moderate levels of resistance to rust, LLS and ELS annually for ICRISAT - 15 in ESA, 15 in WCA and 10 in SA and once in project life - 5 each for Nigeria, Burkina Faso, Tanzania, Ghana, and Uganda. If there is no program targeting this trait now then materials can be shared. Develop SD + drought tolerance (10 lines) and SD + high oil (10 lines), SD + confectionery (60 g/100-seed weight, 10 in SA), SD and aflatoxin resistant (10 each in SA, ESA and WCA) annually and once in project life for Ghana (5) and Uganda (5). High oil: 53% +or-2. Other interested countries could share materials. Develop drought tolerant breeding lines: Annually at ICRISAT 15 in WCA, 15 in ESA, 10 in SA, and once in project life Nigeria (5), Burkina Faso (5), Tanzania (5), and Ghana (5). Develop medium duration breeding lines (high levels of resistance to Rust, LLS, ELS, GRD/PBND and other stresses) - annually for ICRISAT 15 in WCA, 15 in ESA, 10 in SA and once in project life for Nigeria (10), Burkina Faso (10), Tanzania (10), and Uganda (10) and 5 each for Mali and Ghana. Develop confectionery with improved nutrition annually at ICRISAT 20 in WCA, 15 in ESA, 10 SA, and once in project life for Uganda (5) and Tanzania (5).</li> <li>▪ <b>Testing for release:</b> Trials in 6 locations in each Tier 1 (Nigeria, Burkina Faso, and Tanzania) and Tier 2 (Mali, Uganda, Ghana) focus countries each year. Multilocation evaluation of 10 breeding lines (arising from breeding populations with 25% increase in size) in at least 6 locations in each Tier 1 and Tier 2 country each year. FPVS trials in at least 80 sites at each Tier 1 country per year and 60 sites at each Tier 2 country with at least 30% participation of women farmers. Identify 4-5 superior breeding lines per year from multilocation testing) identified in Tier 1 and Tier 2 countries. 1 or 2 farmer preferred varieties identified in Tier 1 and Tier 2 focus countries each year involving at least 30% women farmers. Nutrition profiling of all candidate release varieties to ensure nutritional status equal to or better than available standards by NARS in Tier 1 and Tier 2 countries.</li> <li>▪ <b>Best bet varieties:</b> 80 demonstrations (0.25 ha each, 2-3 varieties) in each Tier 1 (Nigeria, Burkina Faso, and Tanzania) country per year and 60 demonstrations in each Tier 2 (Mali, Uganda, Ghana) country with at least 30% participation by women farmers. Release of 8-10 tons of breeder seed of at least one best bet variety in each Tier 1 and Tier 2 focus country produced each year. DNA fingerprint database developed by NARS partners from the improved cultivars promoted under TL-II project.</li> <li>▪ <b>Enhancing genetic gains of ICRISAT hubs and partners:</b> Develop and implement a Program Improvement Plan based on the results of the Breeding Program Assessment Tool. This will include ensuring each program has distinct but well-integrated trait pipeline and line breeding components, an appropriate balance of activities to meet both short- and long-term goals, program uses a database to manage trials, electronic data capture, maximizes cycles per year and has a high quality-testing program.</li> </ul>

*Continued*

**Table 3. Agreed activities for each objective in breakout groups *continued*.**

Objective	Key activities/issues to be considered in implementation
3	<ul style="list-style-type: none"> <li>▪ <b>Trait discovery pipeline:</b> Will be implemented by all countries but first four sub-activities (KASPar/ SNP genotyping platform, develop markers using MAGIC population and develop markers for drought tolerance, Striga and bacterial blight resistance) are to be carried out by Nigeria and Burkina Faso.</li> <li>▪ <b>Breeding pipeline:</b> All implementing project countries. At least 30 drought tolerant breeding lines developed using MAGIC populations. Develop 10 low P-tolerant breeding lines using MARS. Evaluate 30 breeding lines with aphid, Striga and bacteria blight resistance using MABC (this is ongoing in Burkina Faso).</li> <li>▪ <b>Testing for release:</b> All implementing partners: IER-Mali, INERA- Burkina Faso, and SARI- Ghana. Evaluation of 60-80 improved breeding lines in at least four locations in each country. FPVS trials conducted with 200 participants (<math>\geq 60</math> women participation) per country per year. 5-10 new varieties identified per country per year for promotion to on-farm evaluation. Profile nutritional qualities of all candidate released varieties by NARS to ensure that nutritional status equal or better than available standards.</li> <li>▪ <b>Best bet varieties:</b> All countries: at least 40-60 demonstrations carried out in each country. 2,000 kgs breeder seed of released varieties produced per target country per year. DNA fingerprint database developed by NARS for improved cultivars promoted under TL-II.</li> <li>▪ <b>Enhance genetic gain of IITA hubs and partners:</b> The Bill &amp; Melinda Gates Foundation will determine the implementing countries.</li> </ul>
4	<ul style="list-style-type: none"> <li>▪ The activities specified in this objective are accepted as they are.</li> </ul>
5	<ul style="list-style-type: none"> <li>▪ The activities specified in this objective are accepted as they are.</li> </ul>
6	<ul style="list-style-type: none"> <li>▪ Agreed on principles of building sustainable seed systems and value chains.</li> <li>▪ Activities and targets agreed on.</li> <li>▪ Complementarity and partnerships necessary – private sector needs to be brought on board</li> <li>▪ Innovative market approaches – small seed packs targeting women and smallholders, farm implements for smallholders.</li> <li>▪ Strategies for sustaining Early Generation Seed Supply (breeder and foundation) remains critical.</li> </ul>

Additional suggestions from the plenary discussions emphasized the following:

- Need for a special session to discuss how to integrate and budget for gender in a cross-cutting manner to avoid duplication and ensure adequately reflection of gender in all objectives.
- To help integrate suggestions well, it is important to incorporate them in country plans.
- Budgeting: TL-III project is shared by all partners. ICRISAT is the lead partner; NARS partners are sub-grantees and responsible for leading the project implementation at the country level.

## 6. Emerging country plans

Participants in country breakout groups discussed specific interventions they would focus on during implementation in order to achieve the indicators under each objective. Objective leaders and scientists from CIAT, ICRISAT and IITA helped the groups clarify pertinent issues within the discussions.

The country groups reported in plenary, the specific interventions they planned under the three key thematic areas of gender, breeding and seed systems. Each country team presented draft plans that they would continue refining in the subsequent MLE discussions that were scheduled to be held on 20-21 August 2015, as well as during consultations within the countries.

Some countries, like Uganda, proposed to incorporate a focal gender person in their national implementation plans for TL-III project. Ethiopia proposed to undertake gender assessment of how men and women participate in farm activities. Mali's plan entailed integration of a gender specialist to work with other scientists in the research process and establish a multi-stakeholder platform to improve dissemination of new legume varieties. Generally, all country plans comprised activities focused on either developing new legume varieties or enhancing farmers' access to existing varieties within the country or from other countries. The detailed country plans submitted by the country teams are available as separate working documents.



*An ICRISAT scientist guiding a country group discussion on work plan development.*

In summary, the following aspects were noted in the draft country plans:

- Participants noted that the country based planning exercise enabled them to have a sense of ownership of the document.
- Involvement of objective leaders in clarifying various aspects during the group discussions improved participants' understanding of the project. The support of objective leaders in refining the plans and activities is still needed during implementation.

## 7. Closing

### Closing remarks

Dr Emmanuel Monyo thanked the Directors Generals of NARS from various partner countries for sparing time to participate in the planning. He noted with great appreciation that in spite of their usually busy schedules, all the DGs of NARS in the focus countries stayed and participated in all the TL-III sessions. This, he observed, was a sign of serious commitment towards supporting implementation of the TL-III project. Thereafter he invited representatives of a few institutions to make brief closing remarks.

On behalf of the NARS, Dr Ambrose Agona, Director General, National Agricultural Research Organization (NARO-Uganda) thanked development partners, facilitators, collaborating CGIAR institutes in the project and the participants. He pointed out the gains made in harmonizing TL-III focus and context at the workshop. Dr Agona urged the participants to live up to the promises they made in the plans so as to demonstrate total ownership and ensure proper accountability to people and government in their countries. He asked them to

consider how to integrate youth in the implementation of TL-III to harness youth skills and energy in positive ventures. He also reminded participants to stay focused to achieve meaningful progress worth reporting during the project MLE sessions on 20-21 August 2015.

Dr Jeff Ehlers, applauded the NARS Directors Generals for being part of the planning process and noted that aligning the plans with CAADP is critical in addressing real issues of development in the focus countries. He hailed ICRISAT and other partners for their continuous support to NARS institutions in capacity building and technology sharing. Dr Ehlers noted the emerging partnerships between ICRISAT, IITA, Bill & Melinda Gates Foundation, and USAID as useful resources to build a vibrant seed systems on, and challenged participants to continue working with great commitment to offer real value for the available resources. He expressed the commitment and continued support from the Bill & Melinda Gates Foundation in steering TL-III forward.

Dr Rajeev Varshney, Principal Investigator (PI) TL-III, delivering the vote of thanks, expressed his gratitude to all the Directors Generals for their participation. He noted that as per suggestions from the evaluation, the project would consider allocating more time in future meetings for detailed discussions. He thanked Dr Carberry, Deputy Director General Research, ICRISAT for committing four full days for the workshop in spite of his busy schedule, and said that this is a reflection of the true institutional commitment to the project. Dr Varshney emphasized that TL-III is a continuation of previous phases and synergies in them should be harnessed. He commended the objective leaders and all partners who worked hard to develop and support TL-III and concluded by thanking all those who participated in organizing and facilitating the event.

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