

## A MONTHLY PUBLICATION OF THE TROPICAL LEGUMES II PROJECT

### About the Bulletin

The Bulletin of Tropical Legumes is a monthly publication of the Tropical Legumes II (TL II) 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 of target countries in Sub-Saharan Africa and South Asia. TL II aims to improve the livelihoods of smallholder farmers in drought-prone areas of the two regions through enhanced grain legumes productivity and production.



## A Profile of Tropical Legumes in Tanzania

### Crops and production trends

Tanzania grows several species of tropical grain legumes. These include common bean, groundnut, pigeonpea, cowpea, chickpea, peas and soybean (Table 1). Annual area and production of the major grain legumes are estimated at more than 1.5 million ha and 1 million metric tons (MT), respectively. According to the Ministry of Agriculture, Food Security and Cooperatives (MAFSC) of the Government of Tanzania, common bean and groundnut occupy approximately 49% and 25% (Table 1), respectively, of the total area planted to grain legumes, followed by pigeonpea, cowpea, chickpea and soybean. Green peas and green bean are also produced for export market since late 1980s and mid 1990s.

Some of the major production areas, according to MAFSC, are Kagera, Kigoma, Mbeya, Iringa and Tanga for common bean; Dodoma, Shinyanga, Tabora, Mbeya and Mtwara for groundnut; Mtwara, Manyara, Dodoma, Lindi, Tanga,

Shinyanga, Morogoro, and Singida for pigeonpea; and Shinyanga, Mtwara, Tanga, Ruvuma, and Kigoma for cowpea (Figure 1). Chickpea is mainly produced in the Lakes Region.

As is the case with many legumes in many countries in Sub-Saharan Africa, productivity has been growing at a much slower rate than area. The overall annual rate of growth (ROG) for area for the period from 1985-2007 was 4.2%, compared to 1.6% for yield (Table 1). Area for groundnut and common bean showed the fastest growth; soybean area grew by about 1.4% per year; chickpea area has not changed whereas the areas for peas and cowpea declined. Estimates indicate that pigeonpea area grew from about 64,000 ha in 2003 to 170,000 ha in 2010 (a 15% ROG). It is also reported to be the highest yielding grain legume in Tanzania (Table 1); this is followed by soybean, common bean, groundnut and cowpea. Peas and chickpea yield less than 500 kg per ha.

Table 1: Production trends of major grain legumes in Tanzania<sup>1</sup>

Crop	Area			Yield		Production	
	000 Ha	ROG (%)	As % of total area	Kg/Ha	ROG (%)	000 MT	ROG (%)
Common bean	756	5.5	49.3	706	0.4	492	5.9
Groundnut	377	8.0	24.6	694	1.3	262	9.4
Pigeonpea	145	0.1	9.5	1,012	1.3	120	1.3
Cowpea	128	-0.4	8.3	578	2.2	74	1.8
Chickpea	64	0.0	4.2	439	1.8	28	1.7
Peas	60	-0.6	3.9	451	2.7	27	2.1
Soybean	2	1.4	0.1	727	<b>2.6</b>	1	4.0
<b>Total/avg.</b>	<b>1,532</b>	<b>4.2</b>	<b>100.0</b>	<b>658</b>	<b>1.6</b>	<b>1,005</b>	<b>5.8</b>

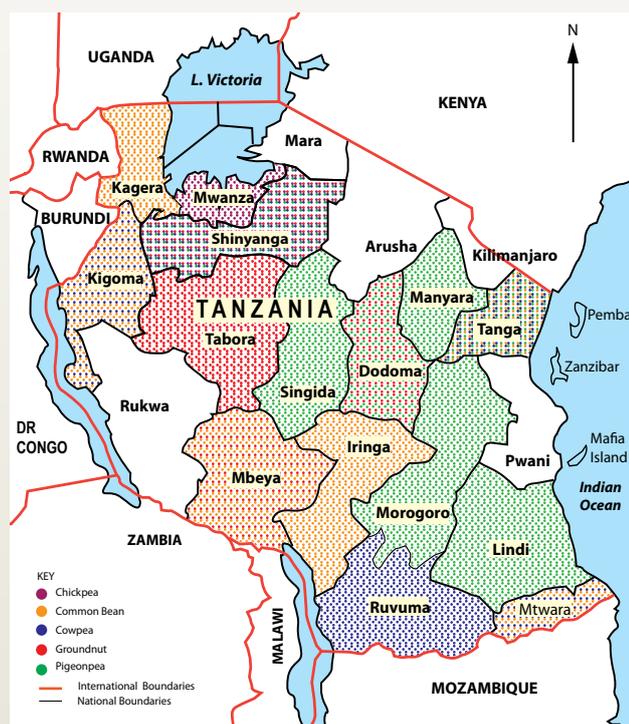


Figure 1: Geographical spread of major grain legumes in Tanzania (not to scale)

## Projections

It has been projected that Tanzania's overall supply of grain legumes would outstrip the national demand both in 2010 and 2020; there would be more supply than demand for all crops but soybean (Table 2). The country would produce approximately 874,000 MT of all major tropical legume grains compared to 755,000 MT demand by 2010, and more than 1.4 million MT production compared to 989,000 MT demand in 2020. In other words, the total production would grow at the rate of 4.7% per year whereas the demand would grow at 3.5%.

The demand for soybean would be more than the supply in both periods. The highest ROG (6.2%) of supply is projected for chickpea, followed by pigeonpea (5.7%), cowpea (4%), common bean (3.7%), groundnut (2.8%) and soybean (1.6%). The highest ROG (4%) of demand is projected for cowpea, followed by common bean (2.9%), soybean (2.8%),

chickpea (2.4%), pigeonpea (2.2), and groundnut (1.3%). It should be noted that the ROGs for supply and demand for cowpea are about the same.

The work of the Tropical Legumes II project is already contributing to the increase in the productivity and production of grain legumes in Tanzania. More than 18,000 farmers have been exposed to new grain legume technologies and a total of nine new varieties (five groundnut and four chickpea) have been released. This was the first ever release of chickpea for this country and first release of groundnut since 1998. A total of 561 MT of improved seed, consisting of chickpea (39 MT), groundnut (251 MT) and pigeonpea (270 MT) has been produced and distributed to farmers during the first phase (September 2007 to August 2011). Five students (1 PhD and 4 MSc) are pursuing their graduate studies in the country; one of them received his MSc in groundnut breeding from Sokoine University of Agriculture in February 2011.

Table 2: Projected supply and national demand (000 MT) of major tropical legumes in Tanzania

Crop	2010		2020	
	Supply	Demand	Supply	Demand
Common bean	561	501	924	666
Pigeonpea	88	60	154	74
Groundnut	102	89	134	100
Cowpea	72	72	107	107
Chickpea	48	25	87	32
Soybean	3	8	3	10
<b>Total</b>	<b>874</b>	<b>755</b>	<b>1,409</b>	<b>989</b>

## Trade

Tanzania's grain legumes export is estimated at nearly 135,000 MT, valued at US\$ 54 million each year (Table 3). Pigeonpea, peas and chickpea account for approximately 56%, 16% and 15% of the total volume of exports, respectively. Common bean, groundnut

<sup>1</sup> Area, yield and production are averages for 2002/03-2004/05 (MAFSC, 2005), except chickpea and peas, which were from FAOSTAT; ROGs are calculated from 1985-2007 FAOSTAT (2011).

and soybean contribute very small proportions to grain legumes export in this country. Approximately 82%, 74%, and 63% of peas, chickpea, and pigeonpea, respectively, produced in Tanzania is exported. Groundnut export<sup>2</sup> in Tanzania fluctuated sharply through the years, with peaks close to 16,000 MT each in 1991, 2003, and 2008. Even though the country could be among the top 10 exporters of groundnut in the world, it receives the lowest price among the top 20 countries<sup>3</sup>, perhaps because of the poor quality of nuts, mainly due to aflatoxin contamination.

Table 3: Grain legumes export in Tanzania<sup>4</sup>

Crop	Volume (000 MT)	Value (US\$ Millions)	% of total volume	% of total production exported
Pigeonpea	75.9	30.8	56.4	63.3
Peas	22.1	9.1	16.4	81.9
Chickpea	20.6	7.0	15.3	73.6
Common bean	9.1	4.7	6.8	1.8
Groundnut	6.0	2.1	4.5	2.3
Soybean	0.8	0.2	0.6	58.0
<b>Total/ average</b>	<b>134.5</b>	<b>53.9</b>	<b>100.0</b>	<b>13.4</b>

Tanzania is currently a net importer of common bean even though it had between 50,000 and 65,000 MT of export in the late 1970s and 1980s. Data for cowpea trade are not available, but it is possible that almost all of the cowpea produced in Tanzania is used for local consumption. In general, only about 13% of the total grain legumes produced in Tanzania is destined for export (Table 3). India is the major export market for Tanzania's pigeonpea, chickpea and common bean.

## Looking ahead

Tanzania has made good progress during the first phase of TL II. The project has catalyzed the release of improved varieties, seed multiplication, capacity building and awareness creation among the legume farming community in the country. Particular attention needs to be paid to doubling the improved seed multiplication efforts. The newly released chickpea varieties would make it possible for a rapid growth and development of this crop, particularly in the Lakes Region, and expansion of its export. Groundnut would also benefit significantly from newly released varieties. The second phase of TL II shall implement the achievements in improved varieties and aflatoxin

management practices to improve groundnut quality and its competitiveness in the world market.

Market opportunities have been growing for pigeonpea; introducing regulations on quality and standards would help smallholder farmers to benefit from premium prices. New varieties of common bean and cowpea are also expected to be released in the near future and help food security of the country. The next step would be to expand the gains made and the excitement created so far, in order to achieve improved productivity and production of tropical legumes in Tanzania. ■

*Tsedeke Abate*

*With contributions from Emmanuel Monyo, NVPR  
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## News and Events

### TL II is in Phase 2!

We are very happy to announce that the second phase of TL II has been approved by the Bill & Melinda Gates Foundation (B&MGF) to run for another three years (September 2011 – August 2014). The agreement was signed between B&MGF Director of Agricultural Development Sam Dryden and ICRISAT Director General William Dar on 2 September 2011. This phase aims to expand the many successes gained and lessons learned during Phase 1. The immediate task of the second phase is to develop country strategies and to align the activities and priorities of the project with those of the Foundation, reflecting its refreshed strategy on agricultural development. For this, four new countries – Burkina Faso, Ghana, Uganda and Bangladesh will be included in this phase, in addition to the 10 target countries in Phase 1. Very many congratulations to the TL II Team! ■

### Pigeon pea varieties from TL II Project being scaled up with AGRA's support in Mozambique<sup>5</sup>

*'I am going to harvest over four bags from this half acre of land this season, instead of one or less as has been the case in the past'* said Mr. Orlando Kumbikani of Nyamitondo village of Barue district, Mozambique. He is among 2,000 farmers who obtained through an AGRA-funded project some medium duration pigeonpea variety (ICEAP 00040) that could yield up to 2 MT per ha under good management.

About 3 MT of this variety was bought by the project from ICRISAT-Malawi program that is supported by the Tropical Legumes II (TL II) Project, funded by the B&MGF. The project leader, Dr. Magalhaes Miguel of

<sup>2</sup> Totals of shelled and unshelled.

<sup>3</sup> Shelled groundnut from Tanzania, Egypt, South Africa, and Australia fetched US\$424, US\$ 1,047, US\$ 1,473, and US\$ 1,821 per MT, respectively, in 2008 (FAOSTAT 2011).

<sup>4</sup> Source: Pigeonpea is from an adoption study by Shiferaw et al (2005) whereas all others are 2005-07 averages from FAOSTAT (2011)



Mr. Orlando Kumbikane (left) in his pigeonpea field in July 2011 with Dr Bashir Jama (right) of AGRA's Soil Health Program

the IIAM (the national agricultural research institute of Mozambique), plans to recover at least 8 MT of the seeds provided to the farmers and pass it to a new set of farmers. Additionally, during the past growing season

the project established 4 ha of pigeon pea for seed supply at Sussundenga Research Station, expecting to harvest around 12 MT of pigeon pea seeds that will be made available to the farmers during the Nov/Dec 2011 planting season. His target is 10,000 of them for the 2011/2012 planting season. He is also banking on obtaining more seeds from the ICRISAT-Malawi scientist, Dr. Moses Siambi, who has been providing technical backstopping on how best to manage the crop and its intercropping with maize. Mr. Kumbikane could get between 700 and 800 USD per MT from the crop that has good export markets to India.

Both AGRA and IIAM are very grateful to the TL II Project and ICRISAT for their cooperation in this project and others promoting pigeon-maize intercrops in Malawi and Tanzania. ■

*Bashir Jama*

5 Dr. Jama is the Director of AGRA Soil Health Program

## Chickpea workshop held in India



Participants of the chickpea review and planning workshop in India

A review and planning workshop of chickpea for TL II in the South Asia region was held on 5-6 September 2011 at the ICRISAT HQ in Patancheru, Hyderabad, India. A total of 32 participants attended this workshop. These included officials and chickpea researchers of ICRISAT; representatives from the B&MGF, and aWhere; and national partners from Andhra Pradesh (RARS-Nandyal and ARS-Darsi), Karnataka (UAS-Dharwad and ARS-Gulbarga), and representatives from Bihar and Orissa. Participants

from Bangladesh were invited but could not attend. The workshop was launched with remarks by Dr David Hoisington, Deputy Director General of ICRISAT; Dr CLL Gowda, Director of Grain Legumes Program; and Dr Brian Love representing B&MGF.

It has been highlighted that good progress has been made during the four crop seasons of the first phase (2007-2011) where nearly 75,000 MT of seed was produced; 27,000 smallholder farmers were exposed

to improved chickpea technologies; and 5,000 small packet seed samples (2-10 kg size each) were distributed, among others. It was reported that the "ruling variety" Annigeri is being replaced by a new variety (BGD 103) in Dharwad. The old variety occupied 89% of the total area in 2007 compared to 49% in 2010. By contrast, BGD 103 covered 23% of the total area in 2010. The introduction of a mobile seed processing plant through the project has helped good quality seed production in Dharwad. It has been reported that farmers in Gulbarga obtained average yields of 450 kg per ha in 2007, compared to 925 kg per ha in 2010. The introduction of improved containers (seed barrels) has helped to keep the viability of seed through two years in Gulbarga. RARS-Nandyal has been able to introduce improved varieties across many villages in Kurnool district of Andhra Pradesh. ARS-Darsi emphasized the development of varieties suited for mechanical harvesting. Heat and drought tolerant varieties would be introduced into new locations in Bihar and Orissa. ■

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