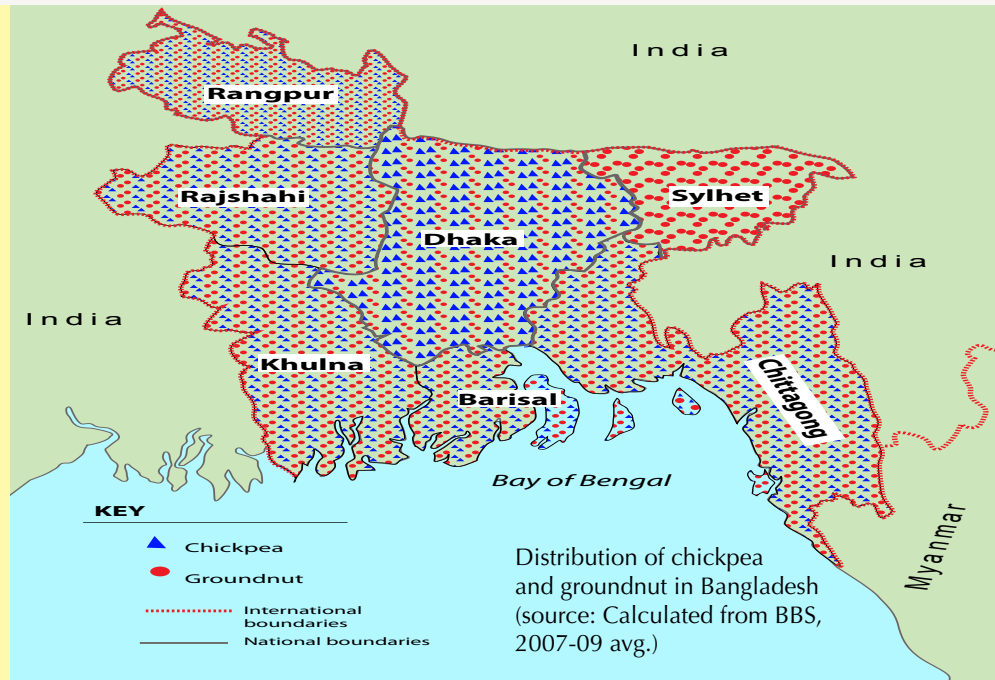


## A MONTHLY PUBLICATION OF THE TROPICAL LEGUMES II PROJECT

### 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.



## Grain Legumes of Bangladesh

### The crops

Bangladesh is endowed with a wide range of crop diversity that includes more than 60 species of cereals, legumes, vegetables, oilseeds, tree crops and many others grown on approximately 15 million ha of land each year. The agricultural scene is dominated by one crop, rice, accounting for more than 75% of the total area harvested, according to the 2007-09 average of FAOSTAT.

Grain legumes play a significant role in the national economy, nutrition, food security and soil health of Bangladesh. A total of nine major grain legumes are grown in one or more of the 21 regions of this country; these are lentil, grasspea (locally known as *khesari*), soybean, groundnut, black gram (*mashkalai*), green gram, chickpea, pea, and pigeonpea (Table 1). These grain legumes occupy an estimated total area of more than 314,000 ha.

Substantial growths in area planted were observed only for soybean; there was little change in groundnut and blackgram area. By contrast, the majority of the legumes showed significant declines in the area planted; these included pigeonpea (-17.44%), pea (-11.01%), greengram (-10.04%), grasspea (-9.73%), chickpea

(-7.70%), and lentil (-6.21%); the average decline for all legumes (not including soybean) was 7.40% as presented in Table 1.

The ROGs for yield for all of the crops shown in Table 1 were positive. Most notable among these were pigeonpea, groundnut, greengram, and blackgram; the overall average ROG for grain yield was 2.66%. However, the positive growths in yield could not offset the declines in area to achieve increases in production. Increases in ROGs for production were positive only for soybean (9.61%), groundnut (3.35%) and blackgram (1.73%); the rest of the legumes had negative growth rates (Table 1).

Lentil area consistently declined from 1980 all the way to 2009 whereas grasspea area showed a fast growth rate starting in the early 1980s but started to decline since the early 1990s. Similarly, chickpea, blackgram, and greengram areas showed growths in the early 1980s but started to decline in late 1990s.

An analysis of the primary crops produced in Bangladesh since the 1980-81 crop seasons indicates a shift from legumes to other crops – such as maize, forage crops, tropical fruit crops, and onions. For example, the 1997-99 average area for maize was 3,238 ha

Table 1: Area, yield, production and annual rates of growth (ROG) of major grain legumes in Bangladesh

Crop name		Area		Yield		Production	
Common	Scientific	Ha	ROG (%)	Kg/Ha	ROG (%)	MT	ROG (%)
Lentil	<i>Lens culinaris</i>	93,695	-6.21	896	0.70	82,961	-5.56
Grasspea	<i>Lathyrus sativus</i>	84,438	-9.73	904	1.09	76,378	-8.75
Soybean	<i>Glycine max</i>	39,589	8.92	1,480	0.63	58,592	9.61
Groundnut	<i>Arachis hypogaea</i>	30,157	0.10	1,504	3.25	45,192	3.35
Blackgram	<i>Vigna mungo</i>	26,913	-0.31	875	2.05	23,583	1.73
Greengram	<i>Vigna radiata</i>	23,031	-10.04	849	3.16	19,565	-7.19
Chickpea	<i>Cicer arietinum</i>	8,250	-7.70	788	1.04	6,488	-6.74
Pea	<i>Pisum sativum</i>	6,986	-11.01	868	1.30	6,057	-9.86
Pigeonpea	<i>Cajanus cajan</i>	964	-17.44	952	8.00	772	-10.83
<b>Total/average</b>		<b>314,023</b>	<b>- 7.40</b>	<b>1013</b>	<b>2.66</b>	<b>319,588</b>	<b>-5.32</b>

Source: Calculated from Bangladesh Bureau of Statistics (BBS); lentil and soybean (available from 2005 onwards) data are from FAOSTAT; area, yield and production are 2007-09 averages; ROGs are for the period from 1999-2009 (except lentil and soybean).

compared to 167,663 ha in 2007-09. In general, the ROGs for maize, forage crops, tropical fruit crops and onion between 1999 and 2009 were nearly 48%, 26%, 18%, and 18%, respectively. By contrast the ROGs for wheat, pulses, sorghum, and barley were -9%, -10%, -17% and -25%, respectively, for the same period. Main driver for increases in maize area and production was expansion of the caged poultry industry from the early 1990s. Their food ration was based on internationally derived rations of mainly a mixture of maize and soybean. This stimulated demand for local production of maize, which otherwise had to be imported. Availability of maize hybrids, mainly from Thailand and India then, allowed much higher yields than existing open pollinated varieties. With rapid expansion of maize area/production, primarily to meet demand of the poultry industry, other uses of maize were realized (e.g. starch) which further stimulated maize production. Only recently has the demand for poultry feed stimulated local soybean due to earlier lack of suitable varieties and appropriate agronomic practices (e.g. availability of *Rhizobium*).

## Areas of production

Grain legumes are widely distributed across the 21 regions of Bangladesh. Details for groundnut and chickpea are presented in Tables 2 and 3, respectively.

### Groundnut

Groundnut is grown in all the 21 regions of the country (Table 2). It occupies more than 30,000 ha of the country's total cultivated area. Noakhali alone accounts for nearly 26% of the total groundnut area, followed by Faridpur (>15%), Dinajpur (<8%), Dhaka (<7%) and Pabna (<7%). Dinajpur, Pabna, and Faridpur have shown the highest rates of growth in the area planted to this crop. The overall growth in area was more or less stagnant. Dhaka and Chittagong each with greater than 10,000 ha area are the largest producers of groundnut in Bangladesh, followed by Barisal, Rajshahi, Rangpur, Khulna and Sylhet (Table 2).

Table 2: Groundnut production trends in Bangladesh

Region	Area		Yield		Production	
	Ha	ROG (%)	Kg/Ha	ROG (%)	MT	ROG (%)
Noakhali	7,762	0.01	1,244	1.46	9,645	1.47
Faridpur	4,624	13.99	1,521	10.70	7,081	26.19
Dinajpur	2,325	47.77	1,427	4.94	3,530	55.08
Dhaka	2,067	-8.35	1,521	7.52	3,144	-1.45
Pabna	1,712	19.56	1,595	2.26	2,739	22.27
Kishoreganj	1,648	-7.26	1,481	-0.78	2,439	-7.98
Rangpur	1,327	-3.37	1,511	13.77	2,001	9.93
Barisal	1,304	-5.61	1,907	9.63	2,485	3.48
Tangail	1,248	28.78	1,300	4.81	1,623	34.97
Chittagong	1,175	-0.34	2,428	5.13	2,877	4.77
Sylhet	844	-8.72	1,696	3.52	1,357	-5.51
Comilla	735	-11.98	1,353	-0.24	1,002	-12.18
Jessore	647	19.89	1,972	8.69	1,251	30.30
Patuakhali	618	-7.39	1,095	-0.52	676	-7.87
Bogra	526	-10.75	1,422	-0.18	748	-10.90
Jamalpur	516	-4.39	2,306	3.23	1,191	-1.29
Mymensingh	401	-6.71	1,201	-1.74	484	-8.33
Kushtia	301	11.55	1,251	1.38	378	13.09
Rajshahi	182	-7.62	1,299	-2.45	238	-9.88
Chittagong HT	167	8.95	1,435	3.15	234	12.38
Khulna	18	8.95	1,727	-2.18	31	6.58
<b>Bangladesh</b>	<b>30,157</b>	<b>0.10</b>	<b>1,504</b>	<b>3.25</b>	<b>45,192</b>	<b>3.35</b>

Source: Calculated from BBS; other details are as in Table 1

The average yield of groundnut for Bangladesh is estimated at about 1500 kg per ha. Regions with substantial growth rates in yield include Faridpur, Dhaka, and Dinajpur (Table 2). The overall ROG for the country is estimated at about 3.3%. Groundnut production in Bangladesh grew at the rate of about 3.4% per year. Regions that have registered high ROGs include Dinajpur, Faridpur, Pabna and Tangail (Table 2). Popular groundnut varieties grown in Bangladesh are Dhaka 1 and Jhinga Badam.

## Chickpea

This crop occupies about 8,300 ha; it is grown in 19 of the 21 regions of Bangladesh. The top four growing regions are Jessore, Rajshahi, Faridpur, and Patuakhali, with areas ranging from about 2,180 to 1,250 ha (Table 3). Sylhet and Chittagong Hill Tracts are the only two regions where chickpea has not been reported. A substantial growth rate (ca. 9.5%) was observed in Patuakhali whereas the top three regions showed significant declines in the area. The overall area planted to chickpea in Bangladesh declined at 7.7% (Table 3). At the administrative division level, Khulna and Barisal have more than 2000 ha each, followed by Dhaka, Rajshahi, Rangpur, and Chittagong.

The average grain yield stands at about 800 kg per ha. Yields showed positive ROGs for the top three producing regions whereas a decline of about 2.2% was observed in Patuakhali. The overall ROG for the country was just over 1% (Table 3).

Production is estimated at about 6500 MT per year. Jessore, Rajshahi and Faridpur are the largest producers; however, all three of them showed declines in the ROG; the overall production declined at the rate of more than 6.7% per year (Table 3).

Overall, Dhaka and Barisal account for approximately 35% and 25%, respectively, of the total grain legumes area (not including lentil and soybean), followed by Chittagong (14%), Khulna (12%), Rajshahi (9%), Rangpur (4%), and Sylhet (<1%).

Table 3: Chickpea production trends in Bangladesh

Region	Area		Yield		Production	
	Ha	ROG (%)	Kg/Ha	ROG (%)	MT	ROG (%)
Jessore	2,182	-10.01	905	2.51	1,968	-7.75
Rajshahi	1,626	-8.42	810	2.15	1,341	-6.45
Faridpur	1,603	-8.03	768	2.96	1,230	-5.31
Patuakhali	1,253	9.46	598	-2.20	752	7.05
Barisal	542	1.26	693	1.92	373	3.20
Kushtia	389	-18.54	835	-1.91	328	-20.10
Dinajpur	280	8.37	721	-0.35	204	7.99
Rangpur	177	20.92	859	2.17	152	23.54
Pabna	134	-6.48	897	6.21	120	-0.67
Noakhali	122	9.76	799	NA	97	NA
Mymensingh	108	7.00	1,139	5.15	124	12.51
Khulna	87	-8.66	796	-1.28	69	-9.83
Dhaka	78	5.84	804	-0.13	63	5.70
Chittagong	49	5.86	746	-3.26	36	2.42
Bogra	28	4.40	938	1.92	26	6.41
Jamalpur	28	2.37	711	-1.45	20	0.89
Tangail	26	-9.21	576	1.30	10	-8.04
Kishoreganj	22	45.24	819	0.04	18	45.29
Comilla	2	-18.08	1,853	13.29	3	-7.19
<b>Bangladesh</b>	<b>8,250</b>	<b>-7.70</b>	<b>788</b>	<b>1.04</b>	<b>6,488</b>	<b>-6.74</b>

Source: Calculated from BBS; NA = Not Available; other details are as in Table 1

Most commonly grown improved varieties include BARI, Chola 5; however, most production still comes from landrace mixtures, including mixtures with earlier released varieties Hyprosola and Nabin, and mixtures with seed of imported varieties as food grain from India, Myanmar, Turkey and Australia.

## Other legumes

Other legumes for which data are available at the regional level include grasspea, blackgram, greengram, fieldpea, and pigeonpea; these combined occupy more than 142,000 ha, of which grasspea accounts for more than 59%. Overall, Faridpur, followed by Barisal, Jessore, Noakhali and Rajshahi is the largest producer. The top five regions for each of these legumes are: grasspea (Faridpur, Barisal, Jessore, Noakhali, and Patuakhali); blackgram (Rajshahi, Dhaka, Pabna, Tangail, and Faridpur); greengram (Barisal, Patuakhali, Kushtia, Noakhali, and Jessore); pea (Faridpur, Jessore, Rajshahi, Noakhali, and Kushtia); and pigeonpea (Kushtia, Rajshahi, Chittagong Hill Tract, Rangpur, and Noakhali).

## Trade

Bangladesh is a net-importer of grain legumes. The 2007-09 average FAO data show that the country imports nearly 668,000 MT of grain legumes with an estimated value of close to US\$ 273 million each year (Table 4). These include lentil (32.6% of value), peas (30.7%), chickpea (20%), soybean (16.1%) and beans (0.6%). Import of groundnut to Bangladesh is negligible. The country is also known for little or no export of grain legumes, according to the FAO data. Import volume and value are projected to increase substantially within the next 10 years, as discussed in the next section.

Table 4: Import volume and value of grain legumes in Bangladesh

Commodity	Volume (MT)	Value (US\$ 1000)
Peas	306,311	83,547
Soybean	139,747	44,001
Lentil	118,368	88,898
Chickpea	99,829	54,432
Beans	3,464	1,676
Groundnut	5	2
<b>Total</b>	<b>667,725</b>	<b>272,556</b>

Source: Calculated from FAOSTAT (2012)

## Projections

Data for projections on production and national demand are available for chickpea, groundnut and pigeonpea. These are presented in Table 5. It can be seen that growths in demand would outstrip those for production for all crops. Production of chickpea, groundnut and pigeonpea is projected to grow at 2.29%, 1.74%, and 1.56%, respectively, between 2010 and 2020. On the other hand, growth rates of 5.60%, 2.83%, and 4.14%, respectively, have been projected for national demand of the three crops during the same period (Table 5).

Table 5: Projected production and national demand for grain legumes in Bangladesh

Crop	Production (1000 MT)				Demand (1000 MT)			
	2010	2015	2020	ROG (%)	2010	2015	2020	ROG (%)
Chickpea	17,857	20,292	22,354	2.29	89,732	118,519	154,849	5.60
Groundnut	38,809	42,560	46,093	1.74	46,139	53,129	61,007	2.83
Pigeonpea	3,092	3,379	3,610	1.56	3,875	4,748	5,816	4.14
<b>Total</b>	<b>59,758</b>	<b>66,230</b>	<b>72,058</b>	<b>NA</b>	<b>139,746</b>	<b>176,395</b>	<b>221,673</b>	<b>NA</b>

Source: Calculated from various sources; NA = Not Available

In monetary terms, this would mean that the country would have imported a total volume of the three crops valued at US\$ 42.2 million by 2010. This expenditure would grow to about US\$ 58 million by 2015 and US\$ 78.6 million by 2020. Chickpea accounts for more than 92% of the total import expenditure through the years.

Bangladesh is a newcomer to the second phase of TL II, where the target crops are chickpea and groundnut. Major areas of research and development would focus on baseline studies, participatory technology selection, fast tracking of

variety development, seed systems, and capacity building. The experience gained and lessons learned during the first phase of TL II in India (and from the many projects in Bangladesh funded by ICRISAT, ACIAR, DFID, CIDA and Government of Bangladesh), would be leveraged to speed up chickpea and groundnut research and development in Bangladesh. ■

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## News and Events

### Regional meetings for 2012

Preparations for regional meetings this year are under way. Venues and dates are summarized below. The main topics for discussion are: a) launching of the second phase; b) review of research activities for the 2011 crop season; and c) preparation of work plan for the 2012 season.

Additional participation will include other partners and stakeholders of TL II in the respective region; representation from B&MGF; and other invited bodies.

Region	Date	Venue	Host institution	Participating NARS
WCA	12-14 Mar	Niamey, Niger	INRAN	Burkina Faso, Ghana, Mali, Niger, Nigeria, Senegal
ESA	11-14 Apr	Nampula, Mozambique	IIAM	Ethiopia, Kenya, Malawi, Mozambique, Tanzania, Uganda, Zimbabwe
SA	14-16 May	Bhabuneswar, India	OUAT	Bangladesh, India (Bihar, Orissa, Andhra Pradesh, Karnataka, Tamil Nadu)

### Conference call of PMT held

A teleconference of members of the Project Management Team of TL II was conducted on 17 January. Participation included David Bergvinson (B&MGF), David Chikoye (IITA), Steve Beebe (CIAT), CLL Gowda and Pooran Gaur (ICRISAT-India), Ndeye Ndack Diop (TL I) and Tsedeke Abate (ICRISAT-Nairobi). The major topics for discussion included country strategies, coordination between TL I and TL II, and data management, among others. It has been stressed that results from baseline studies, with particular emphasis on value chains, should form an important component of the country strategies; a draft strategy document (for each country by crop) would be completed by end of February. Responsibilities for follow up have been assigned. It has been decided that this meeting shall be held for a maximum of one hour every month, to deliberate on specific topics that are relevant to the TL II Project management.