



COUNTRY REVIEW OF BANGLADESH



DR. SULTAN AHMMED

Member Director (NRM)

Bangladesh Agricultural Research Council



Bangladesh with Regional Countries



Bangladesh is a South Asian country lies between $23^{\circ} 34'$ and $26^{\circ} 38'$ N latitude and between $88^{\circ} 41'$ and $92^{\circ} 41'$ E longitude. The country is bounded by India on the west, north, and northeast; Myanmar on the southeast; and the Bay of Bengal on the south.



General Statistics on Bangladesh



Area of Bangladesh	1,47,570 sq.km
Total population	144.05 million
GDP	US \$ 118.42 billion
GDP Growth rate*	6.03%
Per capita Income	US \$ 1044
Manufacturing Sector contribution to GDP	18%
Manufacturing Sector Growth rate	5.73%
Small and Cottage Industries	6.3%
Medium and Large Industries	5.5%
Agriculture contribute to GDP	18.70%
Agricultural Growth rate	2.17%
No. of Farm Household	15.18 million
No. of Non-Farm Household	13.51 million
Cultivated Area	8.52 million ha
Cultivated Area per Household	0.51 ha
Cropping Intensity	190%
Irrigated area	62.96%

Source: Statistical Year Book of Bangladesh (BBS, 2013; *Global Finance, 2012, www.gfmag.com)



Farm Machinery Statistics in Bangladesh



Sl. No.	Farm Machinery	Number of unit
1	Power tiller	About 7,00,000
2	Tractor	> 60,000
3	High speed rotary tiller	> 4,000
4	Weeder	> 2,50,000
5	Seeder Transplanter	➤ 1000 ➤ 150
6	Sprayer	12,50,000
7	Combine harvester	130
8	Reaper	500
11	Open drum thresher	> 2,80,000
10	Closed drum thresher	> 50,000
11	Winnower	> 3,000
12	USG Applicator	> 16,000
13	Hand maize sheller	12,000
14	Power maize sheller	30,000



Agricultural Machinery Adaption Status in Bangladesh



✓ Land preparation	:	>90% mechanical power
✓ Seeding ✓ planting ✓ Transplanting ✓ Fertilizer application ✓ Insecticide application	:	Started by machine (Showing encouraging)
✓ Irrigation	:	>95% by power operated STW/DTW /LLP pump
✓ Harvesting ✓ Reaper & combine harvester	:	Mostly manually >90-95 % >10-5 %
✓ Threshing	:	Rice-wheat >75%
✓ Shelling ✓ Cleanning ✓ Dryer ✓ Storage	:	maize >95% by sheller Started by machine (Showing encouraging)\



Status of Agri-Machinery Manufacturing in Bangladesh



Manufacturing Units	Number
Foundries	70
Agri-Machinery Manufacturing Workshops and Industries	800
Spare Parts Manufacturing Workshops	1500
Repair and Maintenance Workshops	20,000
Mechanics	5,00,000
Village Artisans	1,00,000



Annual Market Size of Selected Agri-Machinery



Agri-machineries	Market size/yr (in million US \$)
Power Tiller (Imported)	50.0
Tractor (Imported)	80.1
Diesel Engine (Imported)	256.9
Tillage machinery (Imported)	9.7
Centrifugal Pump (STW & LLP)	16.7
Spare parts (Local)	237.9
Spare parts (Imported)	71.4
Sprayer (local)	1.5
Sprayer (imported)	0.4
Thresher (Open & Closed drum)	39.5
Maize Sheller	1.3
Weeder	0.6
Harvesting equipment (Imported)	1.2
Rice milling machinery (Imported)	35.1
Sub-total	802.3
Repair & Maintenance	105.2
Total market size	907.5



Type of Crops



<u>Type of Crops</u>	<u>Areas (mha)</u>	<u>Type of Crops</u>	<u>Areas (mha)</u>
Aman	5.61	Wheat	0.42
Aus	1.05	Maize	0.31
Boro	4.76	Potato	0.44
Total Rice	11.42	Jute	0.68

Climate

Rain Fall (mm) 1981-2010

<u>Months</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Av. Rain fall, mm	9.49	20.60	38.54	97.50	231.38	360.29	429.90	337.05	302.705	169.03	30.57	10.23



Temperature (°C) 1981-2010



Months	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Av.Max. Temp. °C	24.75	27.80	31.76	33.68	33.50	32.70	31.69	32.00	31.95	31.74	29.75	26.49
Av.Min. Temp. °C	11.94	15.04	19.57	23.08	24.50	25.75	25.87	26.03	25.50	23.20	18.14	13.36
Av. Temp. °C	18.34	21.42	25.67	28.38	29.00	29.23	28.78	29.02	28.72	27.47	23.95	19.92
Crop Season:	Duration:											
Rabi	16 Oct-15 March											
Kharif-I	16 March-15 July											
Kharif-II	16 July-15 Oct											



Issues :

- Presently country is self sufficient in cereal production as though it's population is increasing.
- 90% of tillage & 95% of irrigation operations are mechanized.
- Farmers are improving their life style day by day as their income increased.

Challenges:

- Increasing labor shortage in reaping & transplanting is a great concern.
- Farmers are suffering from appropriate and accurate machinery related to soil condition.
- Creating plough pan in shallow depth of soil is a matter of great concern.
- Irrigation water & fertilizer use efficiency is low.
- Post harvest loss is very high.



Prime mover



Type of Tractor	HP	Numbers	Issues:
2WT	Less than 10	10,000	➤ Mostly 2WT covers 80% of tillage operation all over the country, which are also used in multipurpose operation.
	10-20	6,90,000	
4WT	Less than 30	3,000	➤ Owners and operators of 2WT can successfully manage the repair & maintenance of their machinery. ➤ Custom hiring sustained both in 2WT & 4WT. ➤ Safety is still under control to the farmers.
	31-40	24,000	
	41-50	13,000	
	51-60	5,000	
	60-80	50	
	81-100	150	
			<u>Challenges :</u> ➤ Prime movers are totally imported.



Status of machinery usage



OPERATIOS	%
Land Levelling	80%
Land preparation	80%
Ditching	10%
Bunding	0%
Crop establishment	
Transplanting/ Seeding	1%
Drill (dry)	2%
Drill (wet)	2%
Broadcast	1%
Crop care	
Sprayer	95%
Broadcaster	95%
Water pump	99%
Weeder	5%
Harvesting	
Cutting	1%
Threshing	70%
Cleaning	5%
Combine	<1%
Drying (mechanical)	<1%

Issues :

➤ Presently 90% tillage , 68% threshing , 95% irrigation , 5% harvesting , 1% transplanting & 5% weeding are mechanized.

➤ Spare parts demand of Engine and other machineries are meeting from local manufacturing.

Challenges :

➤ Appropriate harvesting & drying machinery is essential to introduce.

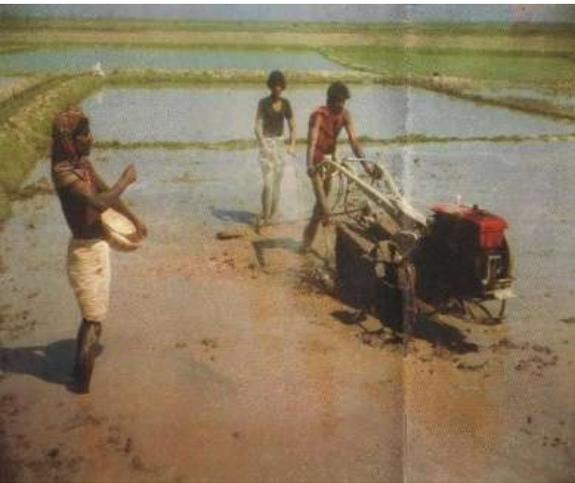
➤ Perfection is still a great concern for most of the machinery.



Present population of Power Tiller (2WT) and Tractor (4WT)



- ❑ Power tiller: 7,00,000 units
- ❑ Annual import: 41,000 unit, worth 4100 million TK. (US \$ 50.0 million)
- ❑ Tractor: 60,000 units
- ❑ Annual import: 6,200 unit, worth 6570 million Tk. (US \$ 80.0 million)





Centrifugal Pump

- Present population of STW: 14,98,386 units
LLP: 1,77,216 units
- Annual production : 5,60,000 unit, worth 16.6 million US \$
- Potential demand : 8,50,000 units annually
- Unmet market size : 5.6 million US \$ annually





Transplanting





Conservation Agriculture



Successful crop production combination with

- **Less soil disturbance**
 - **Beneficial crop rotation and**
 - **Residue management**
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- **Minimum tillage**
- **Strip tillage**
- **No tillage**
- **Bed planting**



Different tillage techniques



Minimum tillage



Strip tillage



Zero tillage



Bed planting



Power tiller operated seeder (PTOS)



(Minimum tillage)



❖ Working as tilling, seeding in line and seed covering in a single pass

- Minimize turn around time
- Timely planting
- Utilize residual soil moisture
- Simple operation
- Seed saved 20%
- Reduced crop establishment cost

❖ Becoming popular among the farmers

❖ Three local workshop start manufacturing



Mung after wheat



- ❖ Mungbean can be fitted with Rice-wheat cropping system
- ❖ Farmers can harvest bonus crop after wheat



Effective capacity: 0.15 ha/hr



Multicrop seeding by PTOS



- Jute seed mix with rice husk (1:4)
- Groundnut planting maintaining proper spacing



Most of the crops can be sown by
PTOS



Urea Super Granules Applicator



- Machine application method saved **time about 80%** and
- **cost of application about 75%.**
- **Urea save 25 to 30%**





Hand and Foot Sprayers



- Hand and foot sprayers are produced locally
 - **Knapsack sprayers are imported from China, Korea, Brazil and India**
 - The local manufacturers collect raw materials from Dhaka market and
 - **Sell their product 30% to district market and 70% to other districts.**
 - Producer are facing some constraints such as
 - ✓ high price and lack of quality raw materials,
 - ✓ lack of skill and knowledge related to production,
 - ✓ lack of market information, etc.
 - ✓ Farmer's are using for their own land as well as custom hiring for other farmers.
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- ❑ **Annual production of Hand and Foot sprayers: 3,00,000 units**
 - ❑ **Annual market size of Hand and Foot sprayers: 1.5 million US \$**
 - ❑ **Annual market size of imported Knapsack sprayer: 0.4 million US \$**



Conventional methods





Combine harvester



Small size



Midium size



Large size



Midium size



Open and Closed Drum Thresher



Population of Open Drum Thresher (ODT) : 2,80,000 units

Close Drum Thresher (CDT) : 50,000 units

Annual production of Open & Close Drum Thresher: 20,000 & 80,000

Annual market size: 3240 million TK. (US \$ 39.5 million)



Rice Milling Machinery



Present population of Rice Mill:

- ❑ **Semi-automatic 650**
- ❑ **Automatic 350,**
- ❑ **Husking 15239 and**
- ❑ **Traditional huller (Engleberg) 1,00,000**
- ❑ **Annual market size: 35.1 million US \$**





Snapshot of different types of Rice Mill



Mill type	Dryer	Roller	Polisher	Color Sorter	Capacity (kg)
Dheki	Sun drying	Manual	No	No	40 per day
Engleberg (Chatal)	Sun drying	Steel Roller	No	No	600 per hour
Engleberg (Huller)	Sun drying	Steel Roller	No	No	350 per hour
Semi-Auto	Sun drying /Automatic	Steel /Rubber roller	Mostly Local made	No	1200 per day
Auto	Automatic	Rubber Roller	Yes	Yes	1800 per hour



Power Maize Sheller

- ❑ Present population of Maize Sheller: 30,000 units
- ❑ Annual production of Maize Sheller: 6,500 units
- ❑ Annual market size: 1.3 million US \$



Status of machinery manufacturing and or machine acquisition

Issues:

- ❑ Almost centrifugal pumps are being used in all Shallow Tube Wells (STW) and Low Lift Pumps (LLP) are manufacturing in the country.
- ❑ Paddy and Wheat threshers, Maize shellers, hand and foot-pump sprayers, weeders, of spare parts engine and machine are also being manufactured locally
- ❑ There are about 70 foundries, 800 agri-machinery manufacturing workshops, 1,500 spare parts manufacturing industries and workshops and about 20,000 repair and maintenance workshops are engaged in agri-machinery sub-sector of the country.
- ❑ RI's & Extension Department are trying to help farmers to choice appropriate machinery.
- ❑ Farmers directly purchase machine through bargaining from nearby local market.
- ❑ Recently government is giving 25% subsidy to the farmers in purchasing machinery.

Challenges: No government policy support remains for the manufacturer.

- More linkage should develop between researchers & manufacturers.



Status of Institutional support

Public R&D institutes are: BRRI, BARI, BSRI, BINA, BAU, BCSIR & DAE. Private workshops/manufacturers/importers are: Alim Industries, Sylhet; Janata Machine, Jessore; Mahbub Engg, Jamalpur; ACI Motors Ltd., Dhaka; Corona Industries Ltd., Dhaka; The metal Pvt.ltd., Dhaka and others .

Issues :

- ❑ Farm machinery dept. of BARI, BRRI, BJRI are contributing in R&D as Bangladesh condition.
- ❑ DAE is providing extension services on agricultural machinery to the farmers & popularizing the newly introduced machinery.

Challenges:

Research & extension dept.'s is needed to be more dynamic with time demanding.



Status of farm infrastructure

Major crops: Paddy ,Wheat, Maize, Potato, Pulses, Oil seeds and Vegetables

Soil type: Small and land fragmented. Marshy land and hilly areas.

Usage of water pump

LLP – Engine(diesel/petrol) 1.00-2.00 Cusec Nos. 1,70,569
Motor

STW- Engine(diesel/petrol) 0.50-0.75 Cusec Nos. 15,23,609
Motor

DTW- Engine(diesel/petrol) 2.00 Cusec Nos. 35,322
Motor

Diesel engine : 4–30 HP; Motor : 0.5–10 HP



Status of farm infrastructure

Operational scale (% area irrigated and irrigation service unit, ha)

LLP – 17.40 % [Command area 6(28) ha]

STW- 60.30 % [Command area 2.50 (5) ha]

DTW- 19.30 % [Command area 23.00 (40) ha]

Manual and others -3.00%

Over all irrigated area 62 %

Challenges:

❑ Small & fragmented land is a great obstacle for mechanization .

❑ Farm owners are involving alternate business rather than agricultural work.



Status of machinery testing center

- ❑ There was a testing center in Bangladesh 1972 to 1988.
- ❑ Presently it is suspended. No specific testing centers for agricultural machinery is exist at present.
- ❑ It was arranged by public ownership and supervisory institutes were BARI, BAU and BUET. Both laboratory and field testing of agricultural machinery/ engines were accomplished in that time.



Policy matters



- ❑ Formulate Agricultural Mechanization policy government should regulate & impose obligation of testing for locally manufactured & imported items.
- ❑ Establishment of national level “Agricultural Mechanization Advisory Committee
- ❑ Establishment of a “National Center for Testing Agricultural Machinery (NCTAM)” for development, testing and evaluation of farm machinery.
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- ❑ In recent years government is giving special emphasise on mechanization & identifying policy issues for testing machinery and other relevant issues.



Thank You Very Much.....

