



WELCOME



Status of Agricultural Engineering, Food Chain Management and Agro-based Enterprise Development of Bangladesh

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Bangladesh Agriculture

Area	147,570 sq.km
Cultivable area	8.29 mha
Population	139 million
Rice area	77%
Agricultural labour	62%
Contribution of agri. to GDP	23.08%

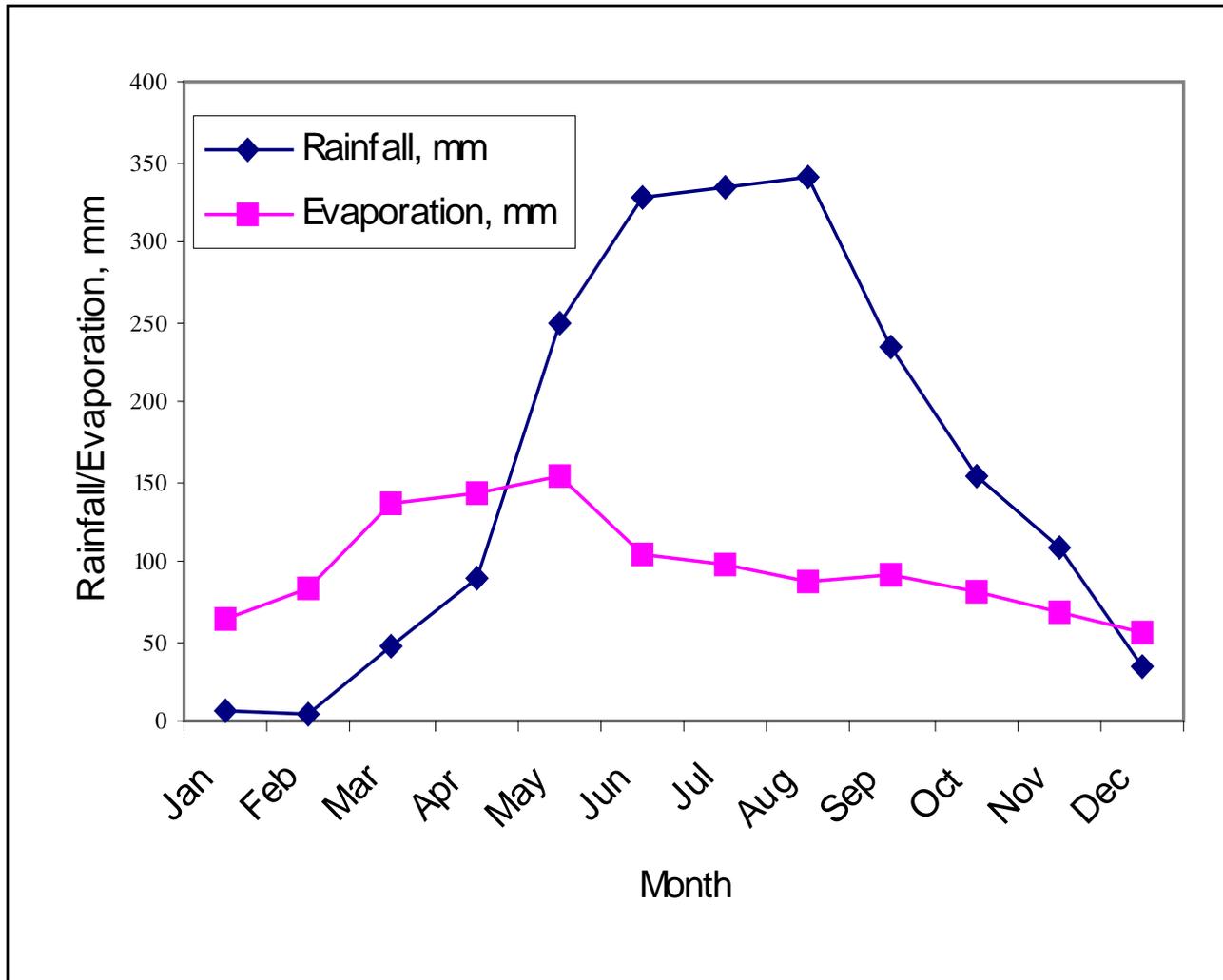


Fig. 1. Average monthly rainfall vs. evaporation of Dhaka.

Table 1. Area, population, and contribution of agriculture to GDP.

Sl. No.	Year	Net cropped area (mha)	Population(million)*	Pop. in agriculture (%)	Contr. of agr. to GDP (%)
1	1970	8.81	71.48**	79 (1974)	59.4***
2	1980	8.45	87.12	57 (1985-86)	54.10
3	1990	8.35	111.46	66 (1990-91)	36.85
4	2000	8.13	123.15	62 (1999-00)	25.58
5	2005	8.02	139.10	62	23.08

* Population of 1971, 1981 so on ** Population of 1974, *** Data of 1973

Table 2. Production and yield of some major crops.

Sl. no.	Year	Rice		Wheat		Maize		Potato	
		Prod. (mt)	Yield (t/ha)						
1	1970	10.75	1.11	0.103	0.86	0.003	0.94	0.85	10.00
2	1980	12.54	1.23	0.83	1.88	0.001	0.50	0.90	9.38
3	1990	17.71	1.70	0.89	1.50	0.003	1.00	1.07	9.15
4	2000	23.07	2.15	1.84	2.21	0.120	5.35	2.93	12.06
5	2005	26.87	2.50	1.05	1.89	0.480	5.15	5.95	14.76

Table 3. Irrigated area with different mechanized irrigation devices

Sl. No.	Year	Irrigated area (mha)			
		DTW	STW	LLP	Total
1	1962	-	-	0.03	0.03
2	1970	0.01	-	0.26	0.27
3	1980	0.24	0.06	0.60	0.89
4	1990	0.45	1.13	0.49	2.06
5	2000	0.52	2.64	0.65	3.81
6	2005	0.65	3.16	0.84	4.65

Source: Bangladesh Agricultural Development Corporation (BADC)

Table 4. Production of HYV rice

Sl. No.	Year	Rice production (m.ton)			Percentage of HYV
		Local	HYV	Total	
1	1970	10.86	0.92	11.78	8
2	1980	8.12	4.42	12.54	35
3	1990	7.57	10.13	17.70	57
4	2000	5.35	17.72	23.07	77
5	2005	3.61	23.26	26.87	87

Table 5. Use of fertilizer and pesticides

Sl. No.	Year	Fertilizer use (kg/ha)	Agro-chemicals use (kg/ha)
1	1970	13	-
2	1980	37	0.25
3	1990	94	0.69
4	2000	134	1.92
5	2005	142	1.56

Table 6. Power sources in agriculture in different years.

Sl. No.	Source	Power rating (kW)	year		
			1960	1977	1984
1	Animal (million)				
2	Bullock	0.180	6.7	7.61	7.69
3	Cow	0.135	2.82	3.32	2.13
4	Buffalo	0.746	0.23	0.24	0.34
5	Human (million)	0.074	14.04	17.01	17.41
6	Tractor	30	-	300	400
7	Power tiller	8	-	200	500
8	Deep tubewell	22	-	4,461	15,519
9	Shallow tubewell	6	-	3,045	67,103
10	Low lift pump	6	-	28,361	43,651
11	Thresher (open drum)	4	-	-	500
12	Thresher (closed drum)	7	-	-	100
13	Maize sheller	7	-	-	-
	Farm power available (kW/ha)		0.24	0.303	0.317

Table 6. Power sources in agriculture in different years (contd).

Sl. No.	Source	Power rating (kW)			
			1989	1996	2005
1	Animal (million)				
2	Bullock	0.180	8.26	8.34	8.28
3	Cow	0.135	3.30	3.42	3.65
4	Buffalo	0.746	0.34	0.24	0.23
5	Human (million)	0.074	32.57	34.53	36.38
6	Tractor	30	1,000	2,000	20,000
7	Power tiller	8	5,000	100,000	300,000
8	Deep tubewell	22	22,448	24,506	27,117
9	Shallow tubewell	6	223,588	325,360	1,128,991
10	Low lift pump	6	57,200	41,816	99,255
11	Thresher (open drum)	4	3,000	10,000	125,000
12	Thresher (closed drum)	7	1,000	5,000	30,000
13	Maize sheller	7	-	100	700
	Farm power available (kW/ha)		0.501	0.613	1.09

Table 7. Relationship of farm power availability and fertilizer input with productivity.

Sl. No.	Year	Rice yield (t/ha)	Farm power availability (kW/ha)	Fertilizer input NPK (kg/ha)
1	1960	0.99	0.240	-
2	1977	1.17	0.303	18.97
3	1984	1.35	0.317	36.55
4	1989	1.52	0.501	52.40
5	1996	1.78	0.613	88.36
6	2005	2.50	1.090	141.74

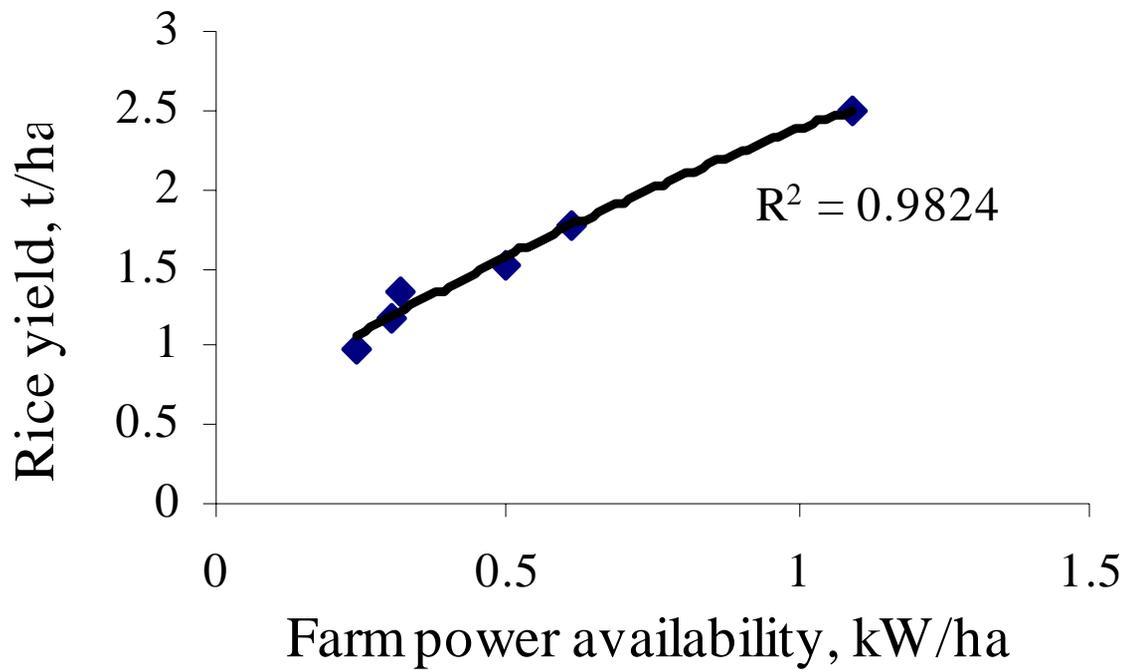


Fig. 2. Relationship of farm power availability with yield.

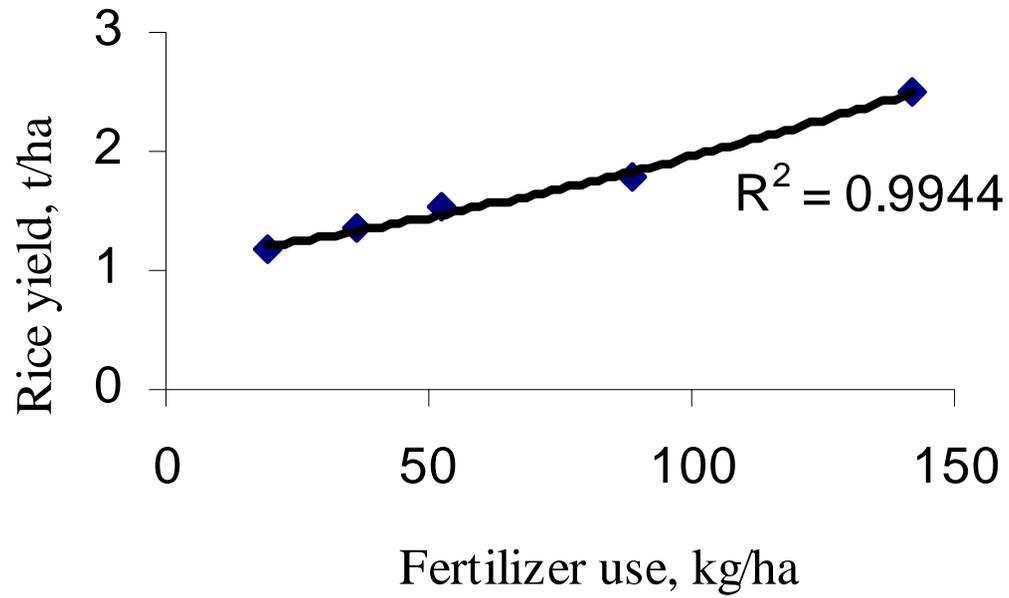


Fig. 3. Relationship of fertilizer input with yield.

Sequence of agricultural mechanization

Present

Water pumping



Pedal thresher



Tillage



Power thresher



Maize shelling



Winnowing



Future

Sowing



Drying



Potato digging



Potato grading



Off-farm use of agricultural machinery

- ☀ **engine of STW for country boat & rice milling**
- ☀ **power tiller for haulage**
- ☀ **tractor for haulage**

Food chain management

Postharvest loss of fruits & vegetables 10-50%

Reasons are:

- 🌍 **Improper harvesting**
- 🌍 **Lack of postharvest technologies**
sorting, grading, packaging, transportation etc.

Average Postharvest loss of mango 27%

(1) poor harvesting

❑ Traditional harvester capacity 157 no./hr

❑ BARI mango-harvester capacity 223 no./hr



(2) Postharvest technology

- sorting, washing, hot water treating, drying, wrapping, packaging, transportation

Hot-water treatment plant
loss was less than 1%



Food processing sector

 **over 22% share of all manufacturing**

 **employs 20% labour force**

 **GDP share 2%**

Proper food chain management contributed in

- **better production**
- **loss reduction**
- **value addition**
- **employment generation**
- **poverty reduction**
- **overall social and economic development**

Agro-based enterprise development

Production Sector

- **High value crop**
fruits, vegetables, spices flowers and condiments
- **Vegetables fruits export**
10th largest export item
- **Fresh and frozen vegetable export**

Per capita vegetables consumption

■ Bangladesh	31 kg/person/y
■ China	204 kg/person/y
■ Japan	112 kg/person/y
■ USA	126 kg/persib/y

Postharvest sector

- emerged in 1990s
- add value
- extend shelf-life
- export processed foods

Conclusion

- with economic development more farm labourers will migrate to urban areas
- shortage of labour will continue
- more farm machinery will be necessary
- scientists and manufacturers need to work more closely
- govt. instruction to bank in financing will accelerate farm mechanization

- rural roads and electricity extension will enhance farm mechanization
- food chain management has ensured food quality improvement, especially fruits and vegetables
- backward and forward linkages have been established
- agro-based enterprises have been developed in both production and postharvest sector
- many enterprises are processing agro products for domestic and export markets

Recommendations

-  **Joint research projects to develop appropriate machinery for sowing, transplanting and harvest may be taken with APCAEM collaboration**
-  **Exchange of ideas with APCAEM member countries to strengthen food chain management**
-  **Improve the capacity of producers, traders, processors, financial institutions and NGOs in food chain management**
-  **Collaboration of agro-based enterprises of APCAEM member countries is necessary to improve their product quality.**

THANK YOU

