

IDEAS Machinery Industry Study Report

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Machinery Industry in Bangladesh

FINAL REPORT

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I. Introduction

1.1 Machinery is central to the process of economic development. It not only transforms inputs into outputs but also embodies technological changes, which holds the key to successful industrial expansion and accelerated economic growth.

1.2 The Bangladesh Case Study under the Joint Study on Machinery Industry in Asia purports to examine the pattern and trend of machinery use in Bangladesh during the decade of the 1990s. The study reviews domestic production and import of machinery using secondary data, and then examines the specific case of machinery use in knitwear industry on the basis of data collected through a sample survey. The knitwear industry was selected for the detailed study mainly because the industry – in both upstream and downstream part – experienced rapid growth in Bangladesh during the reference period.

1.3 The present report is organized as follows. After the introductory remarks in Section I, Section II provides an overview of growth and structural change of Bangladesh economy during 1990s. Section III reviews the state of machinery industry in Bangladesh. This is followed in Sections IV through VI by an examination of the trend and pattern of imports of machinery with particular focus on import of machinery from Japan. The findings of the sample survey of knitwear enterprises are presented in Section VII through XII. Finally, Section XIII provides concluding remarks.

II. Growth and Structural Change of Bangladesh Economy during 1990s

GDP and Population Growth

2.1 Bangladesh economy experienced a trend rate of growth of 4.8 per cent during 1990s as against 4.4 per cent during the previous decade. Growth was particularly pronounced in the second half of the 1990s. Between 1990-91 and 1994-95, the annual compound growth rate of GDP was about 4.7 per cent. During the second half of the decade, GDP growth rate jumped to 5.1 per cent. The rate of growth of per capita GDP has also been impressive during the 1990s. In addition to the higher growth rate of overall GDP, this was facilitated by a sharp fall in the rate of growth of population. During the 1980s, population grew at an annual compound rate of 2.2 per cent, and the rate of growth of per capita GDP was recorded at 1.7 per cent per annum. In contrast, population growth rate came down to 1.7 per cent during the 1990s. In fact, it has been at the level of 1.6 per cent since 1995. Per capita GDP grew at an annual compound rate of 3.3 per cent during the 1990s (Table 1). However, in terms of the absolute level of per capita income, Bangladesh continues to remain at the lower end of the income scale. Per capita income of US\$370 compares unfavorably against the South Asian average of US\$440 and low-income country average of US\$410.

Table 1: Trend Growth in GDP and Population

Year	GDP at Constant 1995-96 Price (million taka)	Population (million)
1990-91	1325224	111.5
1991-92	1392004	113.2
1992-93	1455680	115.5
1993-94	1515140	117.7
1994-95	1589761	120.0
1995-96	1663240	122.1
1996-97	1752847	124.3
1997-98	1844437	126.2
1998-99	1934370	128.1
1999-00	2040200	130.0
Trend 'g' (%)	4.8	1.7

Source: Bangladesh Bureau of Statistics

Export

2.2 During 1990s, Bangladesh's total exports in current US\$ value grew at an annual compound rate of 14.4 per cent. In fact, Bangladesh experienced double digit export growth in most of the years during the 1990s. Imports, on the other hand, grew at an annual compound rate of 10.9 per cent during 1990s. The gap between export and import widened from -US\$1792 million in 1990/91 to -\$2814 million in 1999/00, although the share of export earnings in import payments steadily rose from 31 per cent in 1980/81 to 67 per cent in 1999/00. The openness of the economy as measured by total external trade as a proportion of GDP went up from around 22 percent in 1990/91 to nearly 30 per cent in 1999/00 with the share of export in GDP rising from 7 per cent to 12 percent during the same period (Table 2).

Table 2: Exports and Imports of Bangladesh during 1980s and 1990s

Description	1980/81	1990/91	1999/00	Annual compound growth rate (%)	
				1980s	1990s
Export (million \$)	710	1718	5752	9.2	14.4
Import (million \$)	2282	3510	8566	4.4	10.4
Trade deficit (million \$)	1572	1792	2814	1.3	5.1
Export as % of import	31.1	48.9	67.1		
Export as % of GDP	5.0	7.3	12.1		
Import as % of GDP	16.0	15.0	17.9		
Openness of the economy (%)	21.0	22.3	30.0		

Source: Export Promotion Bureau and World Bank

2.3 The structure of export has changed significantly over the past two decades. Bangladesh seems to have made the transition from resource-based to process-based exports. In 1980/81, primary commodity constituted nearly 29 per cent of total exports. In 1990/91, this share

came down to 17.8 per cent and further down to 8.2 per cent in 1999/00. There has been a shift from jute-centric to garments-centric export. In 1980-81, raw jute and jute goods together constituted 68 per cent of total exports. Between 1980/81 and 1999/00, export of both raw jute and jute products declined in absolute terms and their total share came down to only 6 per cent in 1999/00. In contrast, woven and knit garments together accounted for less than 1 per cent of exports in 1980/81. Their combined share in exports rose to nearly 76 per cent in 1999/00.

Table 3: Changing Structure of Export: 1980/81-1999/00

(million \$)

Item	1980/81	1990/91	1999/00	Growth(%) 1990-1999
<i>Primary commodities</i>	209 (29.4)	306 (17.8)	469 (8.2)	4.9
Raw jute	119 (16.8)	104 (6.1)	72 (1.3)	Negative
Tea	41 (5.8)	43 (2.5)	18 (0.3)	Negative
Frozen food	40 (5.6)	142 (8.3)	344 (6.0)	10.3
Other primary	9 (1.3)	17 (1.0)	35 (0.6)	8.4
<i>Manufactured goods</i>	501 (70.6)	1411 (82.2)	5283 (91.8)	15.8
Jute goods	367 (51.7)	290 (16.9)	266 (4.6)	Negative
Leather & leather goods	57 (8.0)	136 (7.9)	195 (3.4)	4.1
Woven garments	3 (0.4)	736 (42.9)	3083 (53.6)	17.3
Knitwear	0 (0.0)	131 (7.6)	1270 (22.1)	28.7
Chemical products	11 (1.5)	40 (2.3)	94 (1.6)	9.9
Other Manufactured goods	63 (8.9)	78 (4.5)	375 (6.5)	19.1
<i>Total Export</i>	710 (100)	1717 (100)	5752 (100)	14.4

Figures within parentheses show % share in exports

Source: Export Promotion Bureau

Figure 1
Growth in Exports

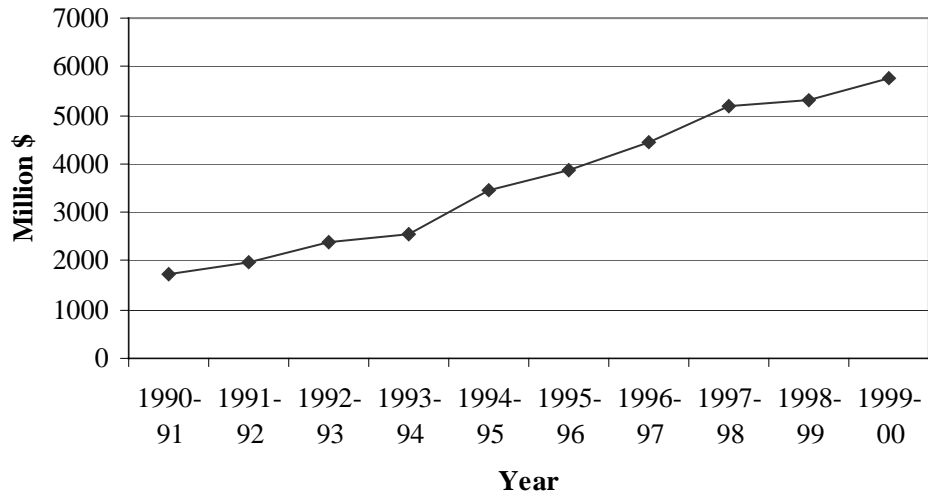
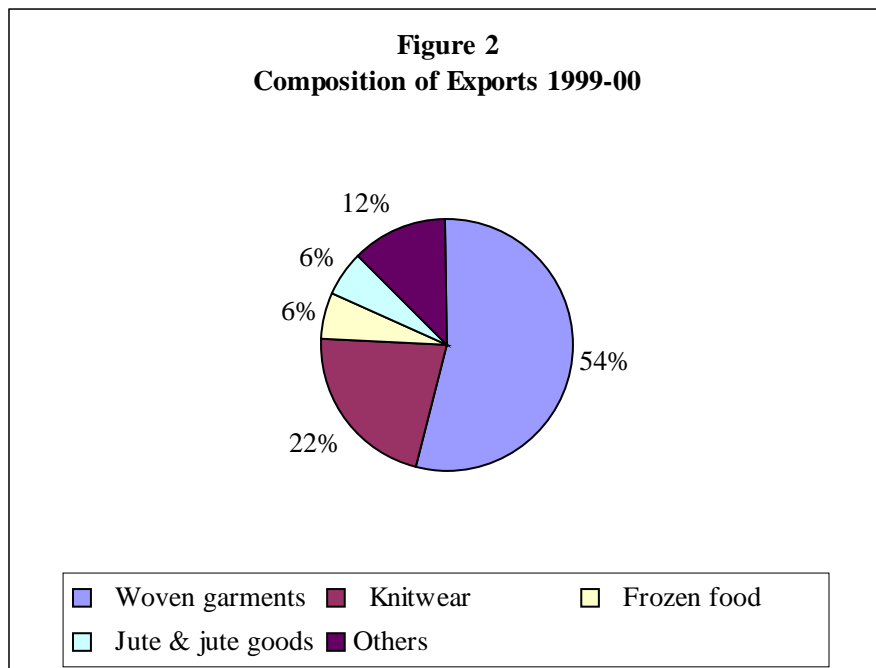


Figure 2
Composition of Exports 1999-00



Structural Change

2.4 A change in the composition of output and employment away from the agricultural sector in the direction of manufacturing and service sectors is often used as a measure of development. In Bangladesh, the share of agriculture in GDP declined from 29.2 per cent in 1990-91 to 25.5 per cent in 1999-00 - a decline of 3.7 percent. The fall was compensated by an increase in the share of manufacturing and construction (Table 4).

Table 4: Sectoral Composition of GDP

Sector	% share at constant 1995-96 price		Annual compound growth (%)
	1990-91	1999-00	
Agriculture	29.2	25.5	2.1
-Crop	18.9	14.4	1.9
Manufacturing	12.9	15.4	6.9
- Large	9.2	11.1	7.0
- Small	3.7	4.3	6.7
Mining and Quarrying	0.9	1.0	6.4
Power, Gas & Water	1.4	1.4	5.2
Construction	5.9	7.8	8.3
Transport, Storage & Communication	9.3	9.2	4.9
Trade	12.8	14.0	5.8
Housing service	9.9	8.9	3.5
Public Administration & Defense	2.1	2.6	7.2
Others (mainly service)	15.6	14.2	3.6
All	100	100	4.96

Industrial Growth

2.5 Manufacturing industry in Bangladesh achieved respectable growth during 1990s (Table 5). The contribution of manufacturing to GDP increased from 12.9 per cent in 1990-91 to 15.4 per cent in 1999-00. However, the sector's current share in GDP appear rather modest for it to spearhead sustained high growth of the economy. Thus, for example, in Thailand the share of manufacturing in overall GDP was 22 per cent in 1980 and it rose to 32 per cent by 1998. The growth of Bangladesh's manufacturing sector has also been rather narrowly based with readymade garments accounting for nearly a quarter of the sectoral growth. Other important export industries contributing to sectoral growth are Fish & seafood, and Leather tanning. Major import substituting industries experiencing significant growth during this period include Pharmaceutical, Indigenous cigarettes (*bidi*), Job printing and Re-rolling mills.

Table 5: Growth of Manufacturing and Share in GDP

Year	Yearly Growth (%)	Share in GDP (%)
1990-91	6.4	12.9
1991-92	7.4	13.3
1992-93	8.6	13.8
1993-94	8.1	14.4
1994-95	10.5	15.1
1995-96	6.4	15.4
1996-97	5.0	15.4
1997-98	8.5	15.9
1998-99	3.2	15.6
1999-00	4.8	15.4
2000-01	9.1	15.8

Source: Bangladesh Bureau of Statistics

III. Machinery Production in Bangladesh

3.1 The machinery industry in Bangladesh consists of a small number of large public enterprises and a fairly large number of medium and small private enterprises. The output of the industry falls under the following major four-digit categories: (3831) Engines and turbines, (3832) Agricultural machinery, (3833) Metal & wood working machine, (3834) Textile machinery, (3835) Industrial machinery, (3839) Miscellaneous non-electric machinery, (3841) Electrical machinery and apparatus, (3843) Electric appliances, (3846) Batteries, (3849) Electric apparatus, (3851) Shipbuilding and repairing, and (3854, 3855) Transport equipment such as motor vehicles and motor cycles etc.

3.2 Although the industry has a fairly large production capacity, the level of capacity utilization, particularly in the large public sector enterprises, has been extremely low (Table 6) and declining. As a result, the share of the industry in overall manufacturing output has been small. In the case of large and medium industry, the share stood at 6.8 per cent in 1990-91 and came down to 3.2 per cent in 1995-96, while the share of small-scale machinery enterprises in small industry output stood at 2.3 per cent in 1995-96.

3.3 As shown in Table 6, most of the major public sector enterprises were set up during 1960s when there was a firm government commitment to develop the public engineering sector. That policy persisted for a short period after liberation. Since mid 1970s, however, the emphasis shifted and the aid-dependent nature of development policy encouraged import of engineering items for which there was huge installed capacity in the country. As a result public sector plants remained highly underutilized.

3.4 An important factor adversely affecting growth of machinery industry in Bangladesh has been unfavorable tariff policy. To encourage private investment and facilitate rapid industrial growth, the government provided easy access to imported machinery by lowering import duty on these items. In contrast, the duty rates on raw materials, parts and components for the

machinery industry remained high. This type of tariff anomaly resulted in negative effective rate of protection for the indigenous machinery industry in Bangladesh.

Table 6: Major Public Sector Engineering Plants

Enterprise	Year of establishment	Employment	Average capacity utilization 1984-90 (%)
Khulna Shipyard	1957	1071	48
General Electric Manufacturing Company	1967	864	20
Chittagong Dry Dock	1967	349	25
Bangladesh Machine Tools Factory	1967	1162	25
Bangladesh Diesel Plant	1968	379	28

Source: M.M. Huq et al, *Machinery Manufacturing in Bangladesh*, University Press Ltd., Dhaka, 1993

3.5 The private sector machinery industry in Bangladesh is dominated by small and cottage units. Reliable and up-to-date data on small and cottage enterprises is missing. One estimate shows that in 1989-90 small and cottage enterprises accounted for nearly 93 per cent of all private machinery enterprises and 64 per cent of all employment in the in that category (Table 7). However, as would be expected, productivity level in the small and cottage units is much lower than that in their large-scale counterpart.

Table 7: Size Distribution of Engineering Plants: 1989-90

Type	No. of units	Employment	Gross output (million taka)	Output per worker (million taka)
Cottage	25,000	75,000	1,500	0.02
Small	3,000	40,000	1,000	0.03
<i>Medium and Large</i>				
Private	2,000	30,000	5,000	0.17
Public	27	35,000	1,500	0.04
All	30,027	180,000	9,000	0.05

Source: M.M.Huq op cit.

Diesel Engine and Pumps

3.6 Diesel engines are required for a number of activities in the country including irrigation (shallow tube-well, low lift pump, deep tube-well), farm machinery (thrasher, grain dryer,

tiller, tractor), transport (bus, truck, jeep, inland water transport, and fishing boats), and for other purposes (power generating sets, compressors, welding sets, concrete mixtures, rice hullers, harvesters, etc.). Bangladesh Diesel Plant (BDP) was set up in the public sector with German collaboration in 1967. BDP established capability of producing with varying levels of local content, diesel engines with one to six cylinders and of horsepower ranging from 8 to 120. Another public sector plant, Bangladesh Machine Tools Factory (BMTF) established a technical collaboration with Mitsubishi Heavy Industries of Japan to produce 10,000 diesel engines per year. Production of diesel engines started at BMTF in 1980 with CKD parts, with provisions to manufacture 16 per cents of parts in-house. A number of private units also manufacture diesel engines in Bangladesh on an assembly basis. As seen in Table 8, production of diesel engines and pumps stagnated during 1990s indicating a rather low level of capacity utilization.

Table 8: Trend in the Production of Major Machinery

Year	Diesel engine (No.)	Centrifugal pumps (No.)	Turbine pumps (No.)	Textile machinery (000 No.)	Electrical machinery (No.)
1991-92	343	4491	229	4484	-
1992-93	103	8207	121	4129	-
1993-94	491	4714	140	387	-
1994-95	520	1813	144	414	192823
1995-96	270	2830	181	432	276378
1996-97	525	2256	271	320	214407
1997-98	360	4806	159	814	220488
1998-99	256	4827	177	741	171570
1999-00	311	4813	179	793	168030

Source: Bangladesh Bureau of Statistics

Textile Machinery

3.7 There are only a few specialized textile machinery manufacturing firms in Bangladesh, although more than 100 firms are known to be supplying spares. In the mid 1980s, BMTF started manufacturing ring frames but success has been very limited. A number of small and medium sized private enterprises specialize in the manufacture of power-looms, reeling machines, pirn winding machines, twisting machine and doobby machine. However, the range of locally made textile machinery and equipment is still very limited and the textile mills overwhelmingly depend on machinery imported from abroad. Local textile machinery manufacturers lack adequate heat treatment facilities as a result of which surface strength of a number of key components cannot be raised to the desired level. The private sector plants are also not equipped with required precision machine tools.

Electrical Machinery

3.8 Established with Soviet aid in 1960s, the General Electric Manufacturing Company (GEMCO) is the largest electrical equipment manufacturer of Bangladesh. Another large-scale producer is GEC Bangladesh, a joint venture between General Electric Company of the UK and the government of Bangladesh, with a sanctioned capacity of 2,400 motors per year on a single shift basis. Khan-Elin, a private sector plant has a sanctioned capacity of 12,000 motors on a single shift basis. Besides these plants, there are half a dozen known firms of smaller sizes that manufacture electric motors in Bangladesh. Other electrical equipment manufactured in Bangladesh includes transformers, lightning arresters and disconnecting switches.

3.9 The industry has been suffering from serious capacity under-utilization, particularly in the large-scale sector. The entire requirement of the country for electrical equipment up to 33,000 volts range could be satisfied from local production assuming capacity utilization in the existing plants. But because of suppressed local demand, mainly due to the import of equipment under aid financed projects at low import duty and also due to tax anomalies making the import of some of the required components (which are required for local manufacture of electrical machine) more expensive, plants are highly underutilized.

Machine Tools Production

3.10 The machine tools industry in Bangladesh was started in the mid-1960s with the establishment of the first machine tools factory in the country, Bangladesh Machine Tools Factory (BMTF). The plant had a very poor start mainly because of management and skill labor constraints. To make the plant fully operational, a management contract was signed with a Belgium company but the company failed to turn BMTF into a viable concern. After the departure of the Belgium Company in 1989, the performance of BMTF continued to remain poor. There was some attempt to make the plant viable by some output diversification in the form of manufacture of irrigation pumps, assembly of diesel engines, and manufacture of power tillers with imported engines. But the BMTF lost its market after the monopoly of Bangladesh Agricultural Development Corporation (BADC) in the supply of agricultural equipment was eliminated. BMTF has now been handed over to the armed forces, but it is yet to emerge as the major supplier of machine tools in the country for which it was established. In the mean time, there has been some growth of machine tools production in the private sector in the small and cottage level plants producing simpler and not precision machine. But the growth of such small-scale private enterprises has been constrained by competition from illegal imports from neighboring countries.