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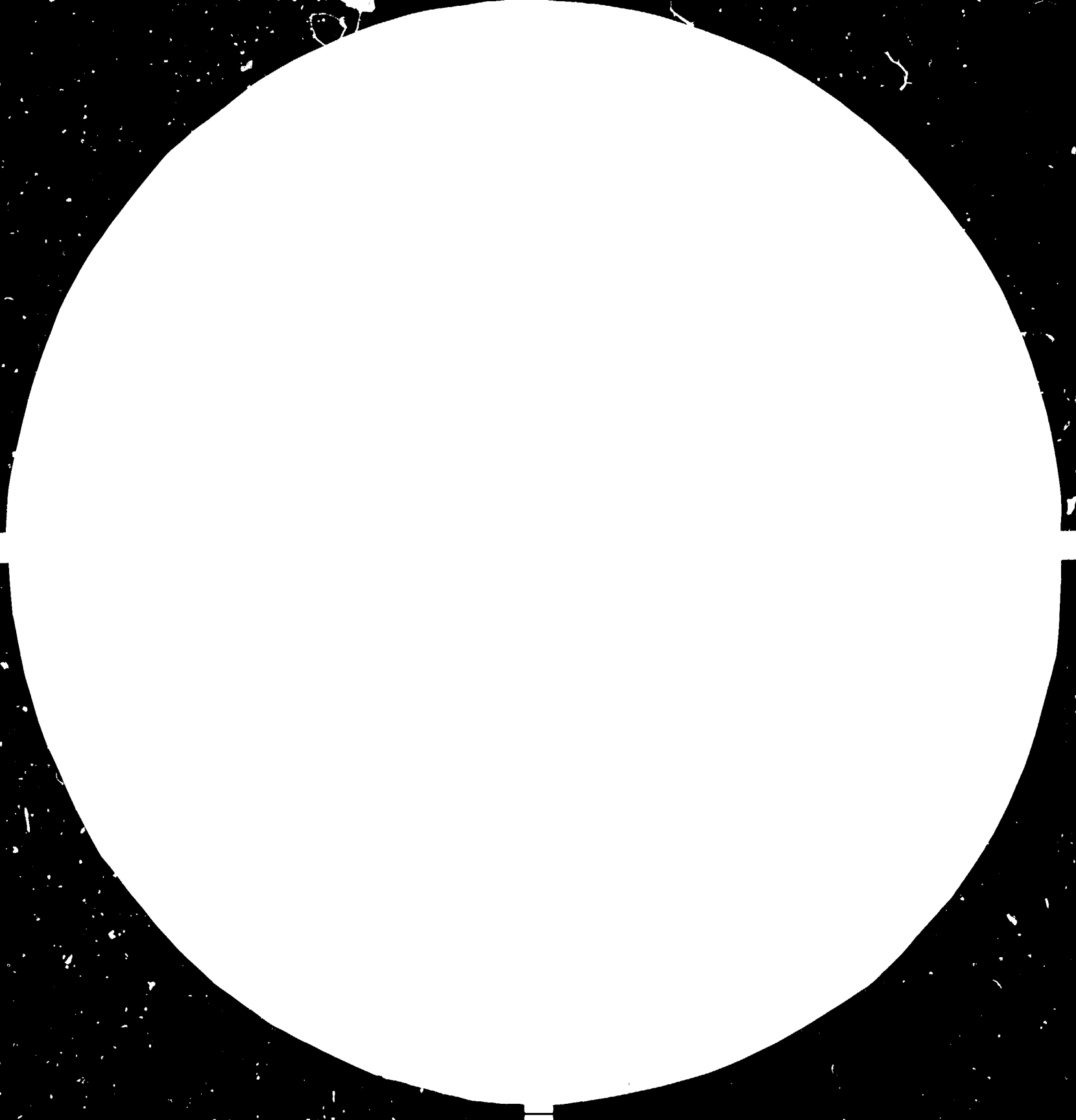


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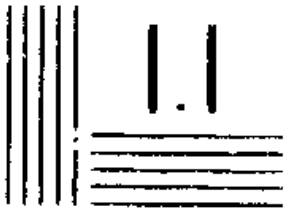
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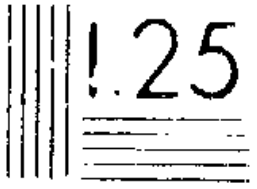
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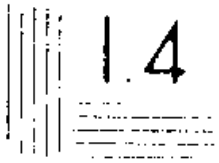
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19 January 1983

TEXTILE INDUSTRY DEVELOPMENT PROGRAMME

DP/BGD/82/006
(DP/BGD/73/049)

B A N G L A D E S H.

TECHNICAL REPORT: ASSISTANCE TO THE SPINNING SECTOR (post 05)

PREPARED FOR

THE GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

BY THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

acting as executing agency for the
UNITED NATIONS DEVELOPMENT PROGRAMME

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION
VIENNA

This document has been prepared without formal editing

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1.0 INTRODUCTION

1.1. PURPOSE OF PROJECT AND DEVELOPMENT OBJECTIVES

The aim of the project has been to assist the Bangladesh Textile Mills Corporation in its efforts to increase the domestic production of cotton spun textiles in Bangladesh, and to reduce the reliance upon imports of cotton cloth. This to be achieved either directly through its composite spinning and weaving mills, or indirectly through a substantial increase in the availability of yarn at appropriate prices for the handloom weaving sector.

1.2. IMMEDIATE OBJECTIVES OF THE PROJECT

A) To upgrade the levels of skill of selected BTMC managerial and supervisory staff and skilled workers in a selected number of mills.

B) To establish central training and advisory services for BTMC mills.

C) To improve the quality of yarn and cloth produced by the BTMC mills through the establishment of quality control and process control measures at all stages of production.

D) To improve machine productivity of the BTMC mills through the establishment of suitable preventive maintenance systems and repair services.

E) To rationalise existing facilities for the production of textile mill machinery and spare parts in Bangladesh.

Supplementary to, and in addition to the above, it was agreed in November 1981 to extend the project activities to assist the BTMC (and subsequently the private sector mills) with the World Bank financed Balancing, Modernisation and Rehabilitation Programme (BMR). This involved

a) the preparation of technical appraisals to formulate bidding specifications, and was to have included -

b) Bid evaluation

c) Scheduling of erection and installation

d) Trial runs and final discharge of the erector/supplier

e) Follow-up and entry into commercial production

f) The general planning, execution and monitoring of specific projects.

Within the time span of the existing project, however, the implementation of items b) to f) were never feasible and would have required further extension of the project.

1.2 (Cont.)

At the time of extending the project terms of reference, the project number was changed from BGD/73/049 to BGD/82/006.

1.3 OUTPUT AND ACTIVITIES

The spinning advisors primary responsibilities are detailed under Part IIF No. 1V of the Project Document and summarised under the given terms of reference:

- rationalisation of the present production programme with a view to reducing the number of yarn counts produced in each mill:
- increase in machine and worker productivity through correct machine settings, improved working methods and suitable maintenance schemes:
- selection and procurement methods of cotton and other raw materials for the industry:
- setting up appropriate quality and process control systems both at the mill and corporation level including the establishment of minimum quality standards.

The above with the overall objective of increasing the productive efficiency of the Corporation's mills to about 3.5oz per spindle shift, with the consequent increase in the availability of yarn to the handloom industry.

2.0 WORK PROGRAMME

Initially the following list of mills were allocated for immediate assistance under post 05.

Bangladesh Textile Mills
Ahmed Bawany Textile Mills
Zeenat Textile Mills
Olympia Textile Mills
Quaderia Textile Mills
Fine Cotton Mills
Kohinoor Spinning and Cotton Mills
Gawsia Textile Mills
Mowla Textile Mills

2.1. RATIONALISATION

The range of counts spun within the BTMC in February 1981 by percentage of total weight were:-

10's	(Ne)	-	4.0%
20's	"	-	4.0%
30's	"	-	4.0%
32's	"	-	45.0%
40's	"	-	31.0%
60's	"	-	6.6%
80's	"	-	2.4%
Others	"	-	3.0%
			100.0%

2.1. (cont.)

The overall average being Ne 36.38 and the two major counts being 32's and 40's. Although some control was exercised by the BTMC Directorate, most mills were spinning the complete range of counts possible with their installed machinery, i.e. 10's to 80's in combed mills, and 10's to 40's in carded mills. Waste being passed down from quality to quality until it was no longer spinnable.

The comparable figures from the BTMC production report for October 1983 are:-

10's	(Ne)	-	2.80%
20's	"	-	6.67%
21's	"	-	4.64%
30's	"	-	2.86%
32's	"	-	34.35%
40's	"	-	38.94%
60's	"	-	7.81%
80's	"	-	0.39%
Others	"	-	1.04%
			100.00%

There are differences in the percentage count distribution, but this can be explained by seasonal demand, and the range of counts spun in individual mills, in 1983, remains much the same as it was in 1981. There are several valid reasons for this, the main ones being pricing policy (particularly for 32's and 40's), at least until recently, and local demand allied to transport difficulties.
The problems associated with yarn selling prices were mentioned in our preliminary report and since then - because of pressure from the World Bank and ourselves - Government restrictions on selling prices have been relaxed and the general principle of Cost plus Profit, variable from mill to mill according to demand, is progressively being established.

TABLE 1 shows the raw material and variable costs for a spinning mill in April 1981 and TABLE 2 shows the approximate raw material, conversion costs and selling prices, for the same mill in December 1983.

TABLE 1

COUNT	10's Cotton	16's Cotton	20's Cotton	32's Cotton	32's Viscose	40's Cotton	60's Cotton
Mix Cost	9.00	9.00	14.51	21.96	14.80	22.14	22.16
Conversion	2.56	3.60	4.49	7.49	7.49	9.49	14.31
Selling & Adminstration.	1.00	1.70	2.22	2.95	2.95	3.43	4.78
	12.56	14.30	21.22	32.40	25.24	35.06	41.25
Selling Price	16.23	22.40	24.37	25.13	22.77	31.89	58.30
PROFIT	+ 3.67	+ 8.10	+ 3.15	- 7.27	- 2.47	- 3.17	+17.05

2.1. (cont.)

TABLE 2

COUNT	10's Cotton	16's Cotton	20's Cotton	32's Cotton	32's Viscose	40's Cotton	60's Cotton
Mix Cost (Approx.)	9.00	9.00	13.42	20.14	15.81	21.62	25.42
Estimated Conversion 1981 + 10% Admin.	3.92	5.83	7.38	11.48	11.48	14.21	20.99
	12.92	14.83	20.80	31.62	27.29	35.83	46.41
Selling Price	23.00	-	28.50	35.50	35.00	37.50	59.00
PROFIT	10.08	-	7.70	3.88	7.71	1.67	12.59

Although individual mill managers are expected to arrange their production mix in consultation with the marketing department of the BTMC, to get maximum profits, it is clearly not now necessary to spin the profitable finer 60's (and 80's) to offset the losses in the main counts of 32's and 40's.
As a result of the new price structure it should now be possible for the market planners in the BTMC, bearing in mind the machinery balance at individual mills, and the permissible average count, to limit the count range, subject to local demand, and so channel the better cottons used in the finer counts to mills with the mechanical capability of exploiting the speed potential of these cottons, and the converse for the poorer cottons.

2.2. MACHINE AND WORKER PRODUCTIVITY

The stated objective of raising the output/spindle/shift to 3.5oz. in the Project Document was given without any indication of the count referred to, and to make this meaningful in the context of mill production, we have assumed this to refer to 32's Ne, which is the base count for all production comparisions used by the BTMC, although the average for the industry is 36's Ne.

To achieve a production of 3.5oz/spindle/8 hrs when spinning 32's with 24 turns/inch, and an overall efficiency of 90%, a spindle speed of 11,760 rpm would be needed. Using the BTMC conversion factors to bring all counts to the 32's basis the comparative spindle speeds for a representative range of counts spun would be as follows:-

2.2. (cont.)

TABLE 3

COUNT	Twist (tpi)	32's Conversion Factor	Production/ Spindle/ Shift.(oz.)	Calculated Spindle Speed (rpm)
10	14.2	0.3405	10.27	8,203
20	19.0	0.6340	5.52	9,386
32	24.0	1.0000	3.50	11,760
40	27.0	1.3220	2.60	11,889
60	32.0	2.2590	1.50	12,194
80	36.0	3.4055	1.02	12,437

N.B. The twist level shown is that laid down by the BTMC but is frequently very much greater and would thus require proportionately higher spindle speeds.
The 32's converted production/spindle for April 1981 at the start of this assignment was 2.41 oz/Spindle which can be compared with the target figure of 3.5oz. This figure can also be resolved into countwise spindle speeds to show the effective spindle speeds which were actually being achieved. These are shown in TABLE 4 below.

COUNT	Twist (tpi)	32's Conversion Factor	Production/ Spindle/ Shift.(oz.)	Calculated Spindle Speed (rpm)
10	14.2	0.3405	7.08	5,655
20	19.0	0.6340	3.80	6,461
32	24.0	1.0000	2.41	8,097
40	27.0	1.3220	1.82	8,322
60	32.0	2.2590	1.06	8,617
80	36.0	3.4055	0.70	8,535

Within the constraints which every mill has to work in Bangladesh, the Spindle Speeds listed in TABLE 3 to give a 32's converted production of 3.5 oz are unrealistic.
The constraints can generally be placed into two catagories -

(a) those affecting the spindle speed and

(b) those factors affecting the utilisation of spindle capacity

(In this context it should be noted that even with the comparatively low production of 2.41oz. in April 1981, the spindle utilisation was only 79% so that effectively on installed spindleage the production/spindle was 1.90oz.

2.2. (cont.)

The constraints can generally be stated as:

Factors affecting spindle speed

(a) Raw cotton quality which is governed by the cost which the majority of consumers can afford to pay for the ultimate cloth, rather than the spinning performance of the yarn.

(b) Technically obsolete, or run down equipment in a majority of mills, incapable of high spinning speeds.

(c) Lack of climatic control.

Factors lowering utilisation

(d) Frequent count and quality changes because of inadequate stocks of raw cotton.

(e) Chronic shortages of essential spares and consumables.

(f) Generally poorly trained and ineffective supervisors and mechanics.

(g) Excessive absenteeism.

(h) Frequent power interruptions.

(i) Raw cotton shortages.

Assuming that the ring frame is mechanically capable of a particular spindle speed, the determining factor for spinning speed, at an acceptable end breakage rate, is the strength of the yarn produced. In turn the strength of the yarn is dependent upon:-

(1) the raw material used, which must be of a suitable staple length, fineness (to ensure a minimum number of fibres in the yarn cross section), maturity and fibre strength and

(2) the technological standard of the processing up to and including spinning.

Our efforts have been directed to improving the technological standard of processing, within the limits of the installed equipment and also improving production control methods.
We have attempted to develop the ideas on which current textile technology is based and developed a standard approach to each mill we have worked in. This is summarised below under the appropriate headings:-

2.21. PRODUCTION CONTROL

On the basis of the stated yarn counts, we have encouraged management and counterparts, to make a spin plan, using existing machine speeds and appropriate technical conditions, to establish the maximum production that could be attainable at acceptable efficiencies. From the spin plan it has then usually been possible to identify problems due to production imbalances, or supervisory problems, which management has then had the opportunity to correct within their available resources.

2.22. COTTON MIXING

We have requested that information be available to each mill showing the measurable characteristics of

(i) Fibre length and percentage short fibre.
(ii) Trash content
(iii) Micronaire
(iv) Pressley strength

It has been stressed that the number of bales represented in a cotton mixing, and control over the characteristics of the bales which make up the mixing, together with added waste, directly affect the spinning performance and quality of the yarn produced.

2.23. OPENING AND CLEANING

In addition to the usual lap weighing procedures to a ± 3oz tolerance we have advised at least weekly statistically analysed regularity checks of the lap - C.V.% (yard by yard) and cleaning efficiency checks by Shirley analyser.
On the basis of these results, corrective action could then be implemented where necessary to control and cleaning points.
The standards we have endeavoured to apply are:-

Scutcher Lap C.V.% - Manual doffing - Max. 4%
" " " - Auto " - Max. 2%
Cleaning efficiency - 60%

Regular maintenance and lubrication schedules were also detailed.

2.24. CARDING

Both flexible wire and metallic wire cards are in use in Bangladesh, often side by side in the same mill. It has been necessary to lay down rather forcibly the different operation and maintenance procedures to be followed for the two wire specifications.
For both specifications we have stressed the need to base all maintenance, and stripping cycles, particularly in the case of metallic wire, on nep counting results, after establishing standards.
With metallic wire, where experience appeared to be particularly lacking, we have advised that with new wire, stripping (based on nep count results) should not be necessary more than once per week of three shift working, since stripping takes the edge off the wire and increases the need for grinding. For grinding we have suggested the following routine:-

"New wire, with a minimum of stripping, keeps its edge for a relatively long period of time; the time determined by the material throughput, but as the wire ages then the frequency of grinding necessary will increase. Because of this, grinding to a schedule should be completely discouraged.
Nep counting should be used to determine the condition of the card, and when every other possible cause for excessive neps has been explored and eliminated, then grinding should take place. If ground correctly the wire should lose less than 0.001" in height at each grinding. On this basis, considering the wire in use, the wire can be ground approximately 15 times before it needs replacing.

2.24. (cont.)

Grinding Procedure

(a) Check cylinder/doffer setting and record
(b) Mount grinder about 0.006" clear of cylinder
(c) Lubricate Horsfall roller end bearings and check Horsfall is in good condition. Best results are usually obtained by using a soft stone, NOT emery covered rollers.
(d) Start card with cylinder reversed.
(e) Gradually set the grinder at each bracket in turn, but only when the grindstone is at the side receiving adjustment, until sparking occurs over the entire width of the card.
(f) Gradually set the grinder in until the correct grinding pressure is reached. (This is usually when the spark from the grindstone is approx. 1" long.
(g) Maintain correct grinding pressure by setting in the grinder as required.
(h) After six to eight minutes grinding pressure, set the grinder clear of the wire and stop the card.
(i) In practice a microscope should then be used to examine the leading edge of the teeth. Without a microscope the only way is to check by feel.
(j) If the wire does not have bite across most of the width, continue grinding for a further four to five minutes.
(k) Stop and recheck and repeat as necessary.
(l) When grinding is complete reset the card and start up. (From this you will have some idea of how much has been ground off the wire after first having checked the setting."

Another difficulty encountered in carding, which required correction in certain mills, was the non-standardisation of side shaft pinions and web draft pinions (calender end roller wheels) for specific hanks. The advice given was to take corrective action at the scutcher or second passage drawing frame for wt/unit length correction purposes, NEVER at the card.
Card settings in general were already very clearly understood and well carried out in spite of a very limited availability of card setting gauges, particularly trowel gauges.

2.25. DRAWING

To produce even regular yarns, capable of high spinning speeds, it is essential that drawn sliver to the highest evenness standards is produced. A large number of existing drawing frames within the BTMC (and outside the BTMC) are barely adequate from either a mechanical or a technological evaluation and therefore do not produce sliver of the standard required for high speed spinning. Further there is a lack of appreciation of the need to establish maximum and minimum top covered roller diameters and strict roller buffing schedules in the context of sliver evenness.
Wherever we have been employed in an advisory capacity we have stressed these points and also adhered to the "hook fibre theory." That is, with carded yarns, an odd number of processes (reversals) should be employed between carding and spinning to ensure that 'trailing fibre hooks' are presented to the spinning frame drafting system, and when processing sliver for combing, it is advisable to have an even number of fibre reversals between carding and comber to ensure that 'leading fibre hooks' are presented to the comber

2.25. (cont.)

cylinder. After combing the hooks have been removed, consequently the number of reversals is not important. Hence, technologically, the correct sequence of processing for carded and combed yarns has been advised as:-

CARDED	COMBED
Card	Card
Drawing	Drawing
Drawing	Lap Former
Simplex	Comber
Ring Frame	Drawing
	Drawing
	Simplex (2 passages for 80's & 100's)
	Ring Frame

In certain older mills within the BTMC the use of three passages of drawing has been discouraged, and two passages only recommended to obtain the correct number of reversals, after adequate trials had shown improved results.
The importance of ensuring that all stop motions operated at drawing frames and lap formers was repeatedly emphasised in the context of yarn evenness and count variation.

2.26. COMBERS

Waste extraction, based on the use of the fibre diagram has been encouraged, and setting the comber so that there is little variation in waste extraction at each head.
Because of damage to top combs, cylinder needles and poorly maintained detaching rollers, long fibre was frequently found in the waste extracted, and we made every effort to eliminate these problems by replacement of top combs, re-needling of cylinders and a general improvement in settings.

2.27. SIMPLEX (SPEED FRAMES)

Speed frame efficiencies are particularly low, and doffed packages are restricted in size, because in general the machines incorrectly set. This is usually due to the apathy and frustration of speed frame mechanics, disgruntled by a lack of spares and excessive quality changes. There is also a reluctance, particularly at this machine, to impart knowledge to subordinates. This difficulty is compounded by the inability of technical management to fully understand the machine and thus not able to insist on standards being maintained.
We have, where possible, removed the mystique and explained the principles involved to as wide an audience as possible.
At this process, also, two passages of flyer frame were employed at

2.27. (cont.)

some mills, for the spinning of carded yarns, in conjuntion with two passages of drawing, which gave the wrong direction of fibre hook presentation for spinning at the ring-frame. This has been discouraged where necessary, although our advice has not always been accepted, usually because of insufficient stocks of the correct size of bobbins for a single flyer frame passage.

2.28. RING FRAME

End breakage rates, in the context of spindle speeds and twist levels, are a good indication of yarn quality at the ring frame, assuming that the ring frame settings are correct. We have used this figure, therefore, to measure our progress in the mills we have worked in, along with the customary C.S.P. (count strength product) results. End breakage rates/100 spindle hours are generally 10-15 times higher in Bangladesh than those found in Europe, and this is reflected in the ring frame allocation/operative. With a maximum break rate of 30 breaks/100 spindle hours an operative can comfortably tend one ring frame.

Since an allocation of one frame/operative is the standard allocation in Bangladesh, and operative wages are relatively low (approx. 20 taka/8 hours) we took 30 breaks/100 spindle hours to be an acceptable break-rate at whatever speed this allowed with a twist multiplyer of 4.25. Consequently, as quality improvements were achieved in preparatory processing and end breakages were reduced we have advised increases in spindle speed, and or, decreases in the levels of twist in the yarn to the BTMC nominal levels, in an attempt to maximise production.

To European ears, a break rate of 30/100 spindle hours, initially at least, sounds totally unacceptable but this had to be determined in terms of local quality acceptance. It can be calculated, for example, that with 30 breaks ona 400 spindle frame that this would give 120 breaks in one hour (i.e. 120 piecings or subsequent knots.) Since the production would be around 10 lb/hr from a frame on 32's at 9,800 rpm we can also calculate the average incidence of knots or piecings in one yard of cloth of a typical construction. For a cloth of 68 ends x 68 picks - 32's Ne, this approximates to an average of 2.3 piecings or knots/square yard, which appears at present to be acceptable, when production is more relevant than quality - this applies to the major proportion of cloth woven.

This situation will gradually change as purchasing power improves and buyers become more discerning, but to achieve higher standards, at maximum production levels, more money will need to be allocated to raw material and standards of machinery and maintenance, which will, of course, be reflected in higher yarn and cloth prices.

Apart from the basic speed of the machines, supervisory and organisational problems within the mills cause considerable losses in production annually.

With the current staffing levels and the fault rates referred to, pneumafil waste losses should be kept to 2% and below, with supervised operative patrolling procedures. This is not the case, however, and waste levels are frequently in excess of 5%.

Doffers have very low work loads, yet ring frames are frequently idle because there are no ring tubes, either because there are insufficient ring tubes in the factory, or there are production hold ups in winding, either through absenteeism or simply insufficient operatives.

Maintenance levels are generally good at the ring frame but are often frustrated by inadequate stocks of cots, aprons, spindle tape and ring

2.28. (cont.)

travellers (which are frequently mixed.) This is in no way a criticism of the maintenance staff, who have usually ordered the items required through reluctant purchasing departments, but rather a sympathetic supporting comment. Nevertheless, idle spindles due to a lack of these items are frequently too high.

2.29. WINDING

Winding is probably one of the most neglected areas of cotton yarn processing in Bangladesh, and we have continually pointed out that it is a waste of time and money to spin a quality yarn if it is then badly cleared and wound.
Our message has been that the user at subsequent multi-end processes expects faults to be removed by suitable clearers, correctly set, to prevent faults and stoppages. When a fault is removed, or the yarn breaks at winding, a knot must be inserted which is less objectionable than the fault removed. Under present conditions in Bangladesh this is certainly not the case. Winding operatives refuse to use mechanical knotters, and very often do not make any pretence of tying knots after a yarn break or a cop is replenished.
The other difficulty encountered has been in the staffing of winding machines, which is specified as 20 drums, regardless of count. We have explained the necessity to vary the allocation of winding drums generally in proportion to the length per unit weight assuming fault rates, package sizes, etc. are constant. There are, however, very obvious labour difficulties to be overcome if this suggesion is to be implemented.

2.30 REELING

Experience has shown that yarn from certain mills commands a price premium merely by giving a consistent length in hank form. i.e. 1680 yards, without too much variation. This is easier to achieve if reeling machines are fitted with measured length stop motions. Wherever possible we have explained these needs in an attempt to improve this situation, again with very little response due to labour difficulties.

2.31. LUBRICATION

Lubrication of machinery is a very neglected area of maintenance. Often there are no lubricants available, and when they are, they are frequently to the wrong specification. In conjunction with the Chief Engineer (BTMC) and The Burmah Eastern Oil Company, a seminar to explain the need for (a) lubrication, and (b) the different types of lubricant necessary, was arranged; to be attended by the technical staff from every mill within the BTMC. At an advanced stage in the arrangements, this seminar was inexplicably cancelled. In spite of repeated follow-up, the idea was never revived.

2.32. PRODUCTION STUDIES

To identify reasons for stopped time and lost efficiency at particular machines, counterparts and mill personnel have been educated in the use of production studies as a tool of management. From this we have also tried to introduce the concept of "block creeling" at the drawing frames and simplex machines. Unfortunately this has not met with too much success because in many instances, measured length meters do not work at the drawing frames.

2.4. RAW MATERIAL

Our aim is to get the maximum possible production - of a yarn of an acceptable quality - at the minimum cost of raw material and production.
We believe this involves carrying out a series of tests at different spindle speeds, to determine the optimum processing costs in terms of raw material, labour, power, space, depreciation, etc. for a given cotton or a range of cottons.
To demonstrate this we carried out spinning trials at a particular spinning mill equipped with spinning machinery installed around the mid. 50's. The trials were made spinning 32's Ne from

(a) the existing mixing with the usual 8 to 10 bales of Pakistani 1" cotton, plus a nominal 10% waste (pneumafil and sliver waste.)

(b) the existing 32's mixing increased to 20 bales of Pakistani 1" cotton plus a weighed 10% waste.

Tests were made at the BTMC Central Testing Laboratory to determine the micronaire value for each of 60 bales, together with Pressley Strength and the effective staple length figures. The micronaire values were very consistent and varied only between 4.7 and 5.1. There was no real need, therefore, to average the micronaire in this mixing as would normally have been recommended.
The effective length for the cotton was 1 1/32" with a Pressley Strength between 91,000 and 95,000.
Careful control was kept on the two mixings throughout spinning preparation and end breaks recorded at the ring frame for spindle speeds of approx. 10,000, 9,8000, 8,600 and 7,900 r.p.m.
The results of the tests are summarised in TABLE 5. The 20 bales 32's mixing, as expected, gave the best results at the different spindle speeds, which can be attributed to the larger number of bales used in the mixing, together with the carefully controlled addition of waste.
To determine which speed gave the lowest cost of processing on the basis of the figures obtained we extended the results of the 32's, 20 bale mixing to show the labour loadings, (assuming that the end break shown could be held throughout the package build), calculated pneumafil waste loss and the production per frame per hour at each speed. The accounts department of the mill kindly helped us to calculate the variable cost/lb for each speed with this mixing which are shown in the following table:

(overleaf)

TABLE 5

RESULTS OF COMPARATIVE SPIN TESTS

Spindle Speed (rpm)	Twist (tpi)	End Breaks/ 100 Spdl/ hour	Average Count	C.V.% of Count	Average Lea Strength	C.V.% of Strength	Average C.S.P.	Calc. Op. work load %	Frame Allocation	Calc. Pneumafil Waste %	Prod/ Frame/ hour @ 100% lb.	Prod/ Frame/ hour at effic. lb.	Production Spindle shift oz.
(a) Regular 32's Mixing. 8/10 bales. Pakistani 1" Staple + 10% waste (Effective length 1 1/32"/Micronaire 4.7 to 5.1. Pressley 91 to 95,000.)													
10,000	24	58.5	32.94	4.48	45.45	9.35	1497						
9,800	24	64.9	33.45	4.32	44.10	9.99	1475						
8,600	24	36.8	32.77	5.61	48.65	8.36	1594						
7,870	24	31.7	33.43	4.99	47.45	6.79	1586						
(b) Special 32's Mixing. 20 bales. Pakistani 1" Staple + 10% waste (Effective length 1 1/32". Micronaire 4.7 to 5.1. Pressley 91 to 95,000.)													
10,000	24	34.5	30.70	3.80	55.80	7.87	1713	86%	1	1.43	10.96	9.95	3.03
9,800	24	30.4	30.45	5.07	60.55	11.30	1844	81%	1	1.01	10.63	9.70	2.96
8,600	24	19.6	30.36	3.94	58.45	6.64	1774	59%	1	0.33	9.33	8.60	2.62
7,870	24	13.5	30.53	3.76	54.40	6.40	1661	50%	1	0.17	8.54	7.89	2.40
									2	0.67	8.54	7.85	2.39

2.4. (cont.)

COST PER lb (BASED ON TABLE NO. 5

Spindle Speed R.P.M.	7,870*	7,870	8,600	9,000	10,000
Stores	0.700	0.700	0.700	0.700	0.700
Power	0.855	0.859	0.937	1,056	1.084
Wages/Salary	3.660	3.720	3.690	3.660	3.650
Depreciation	0.206	0.205	0.188	0.167	0.163
Interest	4.690	4.670	4.280	3.800	3.700
Other	2.590	2.570	2.360	2.090	2.040
TOTAL	12,701	12.724	12.155	11.473	11.337

* At 7,870 r.p.m. and the end breakdetermined it was possible to allocate two frames/operative, cost for two and one frame/operative were, therefore, calculated for this speed.

As expected, costs fall with increasing spindle speed. No account is taken in these costs, however. of the increased "wear and tear" on the machinery at the higher speed, and which would probably result in a higher stores and depreciation figure than that shown. Beyond 10,000 r.p.m. the work load would also be too high for one operative/frame with this cotton.

The main conclusions from this trial were:-

(1) A larger mixing, at least 20 bales, with micronaire maintained around the average, and waste added in a controlled way will give improved results.

(2) The permissible spindle speed of 9,800 r.p.m. at this mill with the particular cotton is sufficient to give a production of 2.9oz/spindle/shift, providing all the other relevant constraints are eliminated.

(3) Lowering the end breakage rate by reducing spindle speed allowed a ring frame allocation of 2 frames (4 sides) per spinner to be considered. Because of the low cost of labour, however, this does not have any significant effect on the cost/lb of yarn produced at present.

Other very general conclusions which may be drawn are:-

(A) If an acceptable end break figure is known (and we now believe this to be approx. 30 breaks/100 spindle hours) the optimum spindle speed, for a particular mill, can be established for a given cotton. Conversely, taking a maximum mechanical spindle speed at an accepted end break rate, and operative loading, the price we can afford to pay for the cotton can also be calculated.

2.4 (cont.)

(B) Particular mills may have a mechanical speed limitation which is lower than the optimum of the cottor ·d for certain counts. In the interests of the ove. productivity of the BTMC, it may be worthwnile . consider a restriction on count and qualities spun at these mills in these circumstances.

Testing facilities are still limited for incoming raw materials, pending the establishment of the central facility in Chittagong in due course, but meanwhile individual mills can be analysing the types of cotton available to them on the above basis.

2.41. MAN MADE FIBRES

Advice has been given on fibre specifications for man-made and synthetic fibres, used alone, or in mixtures with cotton.
Specifically, in the processing of polyester, where there was insufficient appreciation at mill level regarding the consequences of mixing fibre supplied by different fibre manufacturers, and even fibre supplied from the same manufacturer under different merge numbers.
The spinning limits of the various deniers available to give a minimum number of fibres in the yarn cross section and the relationship to count limit have also been freely discussed.

This can be summarised:

Finest count to be spun	Fibres in Cross Section - 80	70	60
Fibre Fineness	Finest count --------		
1.2 denier. 40 m.m.	54 Ne	63 Ne	74 Ne
1.5 denier. 40 m.m.	44 Ne	50 Ne	59 Ne
2.0 denier. 40 m.m.	32 Ne	58 Ne	44 Ne
3.0 denier. 40 m.m.	21 Ne	24 Ne	30 Ne

The figures being obtained by the following formula:

$$\frac{5315}{\text{Denier x Ne C}} = \text{Fibres in cross Section.}$$

$$\frac{5315}{\text{Fibres x Denier}} = \text{Ne C}$$

Tolerances which can be accepted between component fibre characteristics have also been discussed.

2.5. QUALITY CONTROL

Within the existing limited quality control facilities of the BTMC, Mr. Abul Hossain (Director Operations) Bangladesh Textile Mills Corporation, put forward a discussion document on "Quality Control" dated June 1982 for use within the BTMC mills and requested our comments. We were very encouraged by this development and gave him every support in his efforts. The following is a summary of our suggested additions, or improvements, to his basic proposals and should serve to outline the direction of our efforts:-

2.51. BLOWROOM (OPENING & CLEANING)

(1) Rather than taking lap regularity checks, yard by yard, over only three yards, we suggest a weekly yard by yard check throughout a complete lap of each quality, the results to be treated statistically and expressed as a Coefficient of Variation Percentage (C.V.%).

(2) A lap tolerance of plus or minus 4oz we feel is too tight and should be relaxed to plus or minus 8 oz even for finer counts. Tolerances of plus or minus 4 oz lead to a very high lap rejection rate and a too frequent adjustment of the cone drum regulator.
We would also suggest that the laps, although within the specified tolerances, should be scattered, plus and minus, about the mean weight. If there is a tendency for laps to be consistently heavy, or light, but within tolerance, then adjustments should be made to correct this.

(3) In addition to these points, in the event of irregular laps, the following points should be added to your list of checks:

- Photo-electric cells (where fitted)
- Swing door mechanisms and limit switches functioning correctly
- Piano feed regulator operating correctly.
- All blenders operating

(4) Cotton Trash content and cleaning efficiency of the Blow-Room.
With each new consignment of cotton, the cleaning efficiency of the line, together with the waste content of the cotton should be checked. To check the waste content, all machines in the blowroom, and the card should be thoroughly cleaned and sheeted with paper to collect all waste at the take-out points. The weight of the droppings over a given period, expressed as a percentage of the total throughput can then be used to calculate the waste percentage. Any minor differences being attributed to invisible loss which would include dust, moisture, etc.

$$\text{i.e.} \quad \frac{\text{Weight of droppings}}{\text{Weight produced} + \text{droppings}} \times 100 = \text{Waste \%age}$$

/...

2.51. BLOWROOM (cont.)

(4) cont...

The cleaning efficiency of the blowroom is:

$$100 - \left(\frac{\text{Trash content of lap}}{\text{Trash content of raw cotton}} \times 100 \right) = \text{Cleaning efficiency}$$

2.52. CARDING

(1) We believe that the wrapping of card sliver is sufficient at once/week, but accepting Mr. Hossain's reasoning we would reluctantly accept a frequency of once/day, as a check on operatives, but no pinion changes should be made at the card to correct weight variation.

(2) The wording of the instruction regarding card sliver weight should be changed to "Card sliver weight should be fixed by mill technicians in the light of their experience and the condition of their cards."

We would suggest the following as a guide:

10's - 20's - 0.12 hank
32's - 40's - 0.13 hank
60's - 80's - 0.16 hank
100's - - 0.20 hank

(3) Central testing should review nep count standards for different growths of cotton and establish minimum standard nep levels, and review periodically.

(4) See addendum, reference instructions for grinding and stripping of cards.

2.53. DRAWING FRAME

(1) The draw frame sliver weight should be set to achieve an adequate production balance and a guide to sliver hanks would be:

10's - 20's - 0.12 hank
32's - 40's - 0.14 hank
60's - 0.20 hank
80's - 0.24 hank

(Assuming single passage speed frame with a maximum draft of 10.)

Regardless of sliver testing the condition of draw frame roller cots and stop motions should be checked at least once/day and regular cot buffing schedules implemented.

2.53. DRAWING FRAME (cont.)

(2) Sliver wrapping tests should be taken on each finisher head (6 yards) every 4 hours and pinion changes made on the basis of this.

2.54. SIMPLEX

(1) A wrapping test for roving hank, taking 30 yards, should include two bobbins, back and front row. Our recommended frequency of testing would be once/week, but again reluctantly, we would accept a frequency of once/day as a safeguard. Although draft pinion changes should never be necessary at the Simplex, for a given hank roving

(2) Under normal circumstances, with well maintained drafting systems we would recommend maximum ring frame drafts of

CARDED - 33
COMBED - 38

and hanks at the simplex machines should be calculated accordingly.

(3) Twist multiplyers will depend on spindle speed, bobbin diameter (max) and fibre length. A general guide to twist multiplyers would be -

CARDED	1.25 to 1.3 (Up to 1,000 rpm)
COMBED	1.20 to 1.3
POLYESTER/COTTON	0.9 to 1.0

The level of the twist used at the simplex machine should also be used to determine the break draft at the ring frame drafting system. This usually approximates to the Simplex twist multiplyer.

2.55. RING FRAME

(1) Daily Spun count check - 2 bobbins/side

(2) Twist - We consider daily twist testing unnecessary. A simpler procedure is to have a standard front roller speed for each count spun and a check made on this, or a physical check of the twist wheel on a daily basis.

(3) End breakage test - Tests should be taken at the same point in the bobbin build on a complete frame over a period of one hour. Investigations should be instituted if in excess of standard.

2.6. BALANCE, MODERNISATION AND REHABILITATION PROGRAMME (B.M.R.)

Under the World Bank financed B.M.R. Programme, technical appraisals and the calculation of existing and projected spin plans, based on market predictions, have been undertaken for mills included in this scheme. Initially only the BTMC were included but the scheme was then later extended to include a number of mills returned to the private

2.6. (cont.)

sector under the privatisation plan. The list of the mills assisted are:-

B.T.M.C.

Zeenat Textile Mills
Bangladesh Textile Mills
Ahmed Bawany Textile Mills
Gawsia Cotton and Textile Mills (This was later repeated for private sector management.)
Eagle Star Textile Mills
Amin Textile Mills
Pahartali Textile Mills (No. 1 Mill)
Olympia Textile Mills
Kokil Textile Mills
Mowla Textile Mills (Netherlands Govt. Scheme.) (later repeated for private sector management.)

PRIVATE SECTOR

Halima Textile Mills
Ibrahim Textile Mills
Jalil Textile Mills
Ashraf Textile Mills
Sirajgang Textile Mills
Raj Textile Mills
Gawsia Cotton and Textile Mills
Mainamati Textile Mills
Mowla Textile Mills

Copies of all the individual reports are available on file and a copy has been deposited with the World Bank, Dhaka.

2.7. OTHER WORK

In addition to our planned programme of work, we have from time to time, been specially requested to do additional work on behalf of the BTMC. This additional work is briefly summarised as follows:-

(1) Quasem Cotton Mills - Development work and setting up of a pilot unit to produce polyester/cotton yarn.

(2) Ashraf Textile Mills - Assistance with the production of polyester/cotton yarns.

(3) Zeenat Cotton Mills and Olympia Textile Mills - Short of actually assuming full executive responsibility, we were asked to manage these spinning mills for a period of 3 months and fully implement our proposals. This was accomplished with a considerable degree of success, with production increases of up to 30% at Zeenat and approx. 20% at Olympia.

2.7. (cont.)

(4) Kokil Textile Mills - Survey of technical and mechanical problems, and proposals for improvements.

(5) Sharmin Textile Mills - Survey, with detailed analysis of problems and proposals for improvements.

(6) Valika Woollen Mills - Survey of possible diversification irto other products.

(7) Report for the Chairman of the BTMC - "Exploring possible applications of new methods of spinning in Bangladesh." (Dref. Open end and Vortex Spinning.)

(8) Report for the Chairman of the BTMC - "Analysis of the causes of low production in the spinning mills of the BTMC."

2.8. COUNTERPART TRAINING

(a) SENIOR COUNTERPART - Mr. M. Matin Mahmood
Date Joined: 5.4.81
Date Promoted: 31.9.83.
Period served: 29 months.

(b) JUNIOR COUNTERPART - Mr. Tapan Kumar Biswas
Date Joined: 10.9.1981.
Period served: 8 months.

(c) JUNIOR COUNTERPART - Mr. Jayanta Kumar Kundu
Date Joined: 11.3.82
Period served: 19 months.

(d) JUNIOR COUNTERPART - Mr. Janab Abul Hasham
Date Joined: 29.11.82.
Period served: 12 months.

(a) From the start of my assignment I have had the invaluable, friendly and very loyal support of MR. MATIN MAHMOOD, and without this support - in sometimes very difficult circumstances - we could not have accomplished the work which we did. I am very pleased to record that he has now been deservedly promoted to the post of Head of T.I.D.C. on our completion of assignment. It is unfortunate, however, that because of the abrupt ending of the project that he will not now get the overseas fellowship which would have helped him further.

(b) MR. TAPAN BISWAS worked with us for only a very short period; he did show ability but was severely handicapped by a lack of English, and my equal lack of Bengali, and so it was thought better that he returned to other work within BTMC.

(c) MR. JAYANTA K. KUNDU has developed beyond recognition during the time he has worked with us, and because of his intelligence and all round ability, with the right support he should prove an invaluable asset to the BTMC. The writer has recommended Mr. Kundu for promotion to Senior Counterpart, but because of the internal reorganisation which is taking place within the BTMC this has, unfortunately, been delayed.

2.8. (cont.)

(d) MR. ABUL HASHAM has given us his loyal and enthusiastic support whilst he has been with our team and has progressed considerably. Our premature departure will now probably slow down his development.

From the above it will be clear that we have been fortunate in our team of counterparts and wherever the word "we" has been used in this report it is to be taken as a genuine reference to the work of a team - adviser and counterparts.

3.0 EVALUATION

3.1. RATIONALISATION

Under the present structure of the BTMC we see little hope of further count rationalisation taking place, because although the yarn price structure has been revised there is still the need to utilise excessive waste in lower mixings, and overcome transport difficulties, if the yarn demand is not met locally.
There are plans to decentralise the administration, and reorganise the remaining mills within the BTMC into smaller geographic groupings under local directors. If these plans are implemented, it should then be possible for local directors to rationalise further.

3.2. MACHINE AND WORKER PRODUCTIVITY

The average production/running spindle/shift for October 1983, which is the latest figure available, is 2.59 oz at a capacity utilisation of 88%, compared with the April 1981 figure of 2.42 oz at a 79% capacity utilisation. The April 1981 production figure was an average based on the performance of the 56 spinning mills operated by the BTMC at that time, and the October 1983 figure is based on the performance of the 34 spinning units remaining within the BTMC after privatisation. Over this period an increase of only 7% in the running spindle production can shown, and which, if taken at face value, appears very disappointing. However, the average production/spindle, as quoted by the BTMC - in isolation - does not reflect the real improvement in production which has taken place between April 1981 and October 1983. The production/spindle as quoted by the BTMC refers to the production of running spindles, NOT installed spindles, and if the quoted figures are corrected to show the production/spindle based on installed spindles, the actual increase in production which has been achieved during the reference period can be seen in TABLE 6.

The detailed analysis of individual mill performances used in arriving at these percentage improvements is attached as Appendix 1.

TABLE 6/

3.2. (cont.)

TABLE 6

	Production per spindle (running)	Capacity Utilised %	Production per spindle (Installed)
April 1981 (56 units)	2.42oz	79	1.91oz
October 1983 (34 units)	2.59oz	88	2.28oz
Percentage Improvement	7.02 %	9	19.37 %

During the period April 1981 to October 1983, the monthly mill performances did show fluctuations, particularly for cotton shortages and absenteeism following holidays, but in general the trend has been upwards.
The effect of comparing an average production increase based on 56 units in April 1981 and 34 units in October 1983 has been cross checked by calculating averages for the 31 spinning units which have been operated by the BTMC throughout the reference period and these figures confirm percentage improvement which does not differ too significantly from that shown in TABLE 6.

TABLE 7

	Production per spindle (running)	Capacity Utilised %	Production per spindle (installed)
April 1981 (31 units)	2.47oz	78	1.93oz
October 1983 (30 units)	2.57oz	90	2.31oz
Percentage Improvement	4%	12	19.7 %

The contributing calculated average spindle speeds necessary to give the production of 2.59 oz based on running spindles are given in TABLE 8 for comparison with the speeds shown in TABLES 3 and 4.

TABLE 8/

3.2. (cont.)

TABLE 8

COUNT	Twist (tpi)	32's Conversion Factor	Production per spindle/ Shift (oz)	Calculated Spindle Speed. rpm
10	14.2	0.3405	7.60	6071
20	19.0	0.6340	4.08	6937
32	24.0	1.0000	2.59	8702
40	27.0	1.3200	1.96	8962
60	32.0	2.2590	1.14	9267
80	36.0	3.4055	0.76	9267

Appendix 2 analyses the machinery by manufacturer, and date of manufacturer, which was installed in the 56 spinning units originally operating under the BTMC. It will be noted from the date of manufacture, that in many mills the designed mechanical capability of the machinery is less than that required to meet the spindle speeds shown in TABLE 3 to achieve the 3.5 oz target.
In addition, some managers, judged mainly on profitability, and with an average tenure of only 2 to 3years, nave been reluctant to invest money on essential spare parts, and have shown themselves to be wholly indifferent to the medium and long term effect on their plant, of purely financial decisions. Shortages of money, both local and foreign, have also undoubtedly been a factor but it is very apparent that some mills have suffered more than others of similar specification in this respect.
The net result, however, of all these factors has been to make the production target very unrealistic, without a considerable investment in new equipment and spare parts.

3.3. RAW MATERIALS

Accepting that the quality of the raw materials used is largely governed by the purchasing power of the consumer, nevertheless the best possible use is not always made of the available raw materials. Waste levels, far in excess of those necessary, are tolerated on what is already the major component of cost in the yarn. Admittedly most of the raw cotton purchased finds its way into a yarn, but very often not the yarn for which it was intended, and certainly at a raw material price which because of down grading is lower than the landed factory price. Paradoxically local accountants and management then take pride in the so called high profit yarns, spun from waste, using a fictitiously low raw material cost.
The spinning speed potential of some of the better cottons is not fully utilised, to gain the maximum production advantage, by allowing their use in mechanically outdated, neglected and obsolete mills. The reasons for this has been discussed in the body of this report and these reasons have frequently been discussed during the assignment period. Very little has been done, however, to correct the situation because it is complicated by the problems mentioned under "Rationalisation." Hopefully,

3.3. (cont.)

however, if the BTMC is decentralised and operated as smaller local units, then this problem can also be reduced. Effective mixing of the available raw materials is neglected and is invariably accompanied by the indiscriminate and uncontrolled addition of waste. In spite of repeated advice, at all levels of management and supervision, this practice still persists and is never recognised as related to a poor spinning performance.

3.4. QUALITY CONTROL

Quality control facilities are at present very rudimentary but could still be utilised to better advantage if there were a more meaningful liaison between quality controllers and line management. There is, in general, a lack of urgency in analysing and utilising the information made available to correct, or prevent, forseeable problems, and frequently the figures produced by Quality Control departments seem to be totally unrelated to what should be the main effort of production and quality by identifying problems at an early stage and correcting them. This is frequently a factor causing labour unrest, since most operatives are fully conversant with the causes of the problems which create large fluctuations in their own workloads.

3.5. BALANCE, MAINTENANCE AND REHABILITATION

The BMR technical appraisals carried out should provide an invaluable starting base for the included spinning units, to raise their levels of production and quality. Our main concern, however, is that the implementation will be adequately controlled and supervised to gain the maximum advantage and that the inevitable piecemeal delivery of conversion parts and machines can be organised to minimise disruptions to the overall programme.
It should also be realised that the most important factor, at present, in the spinning mills of Bangladesh must be high machine utilisation, even at the expense of excess labour.

4.0. IMPLEMENTATION

Wherever our team has worked we have generally been afforded the full co-operation of local management, after some initial settling-problems. Frequently, high levels of quality and production were attained during our stay at different mills because a disproportionate amount of the available raw materials, spares and accessories were made available to us. Inevitably this often meant that the performance of the mill then fell again sometime after our departure because the effort could not be sustained due to a genuine lack of resources.

Perhaps the most rewarding phase of the assignment for our particular team was the three months spent at Zeenat Textile Mills and Olympia Textile Mills, from September 1982 to November 1982, at the direct request of the Chairman of the BTMC.

The improvements attained at Zeenat were exceptional and demonstrated what could be achieved with the full cooperation and trust of management with the T.I.D.C. team. The result of our joint efforts was that production rose from approx. 8,500 lbs to over 11,000 lbs per day during the three months, when not affected by factors outside our control, such as power cuts

4.0. (cont.)

and excessive absenteeism following holiday periods. It could also be recorded that Zeenat Textile Mills earned a profit in November and December 1982 for the first time since 1975, and the increased production from spinning undoubtedly contributed to this result. Production has since continued at a higher level than previously, but not at the 11,000 lb per day figure.

There were also impressive improvements at Olympia Textile Mills during this period, but the full benefits of our efforts were frustrated by cotton shortages which caused losses in efficiency through excessive count and quality changes. Nevertheless, we were able to raise the production from 11,300 lb per day to 13,500 lb per day over the three months, when not affected by power cuts, cotton shortages and absenteeism following holidays.

Our experience is that with adequate resources and motivated and involved management the performance of the mills in Bangladesh can be considerably improved. After the implementation of BMR we believe that this could raise the production by possibly another 12% on running spindles to 2.9 ozs from the present 2.59 ozs.

To attain this level of production on installed spindles by improvements in capacity utilisation, however, will require a steady supply of raw materials, spares, reduced absenteeism and more reliable power supplies.

5.0. RECOMMENDATIONS

5.1. MONTHLY PRODUCTION REPORT AND ANALYSIS

Every effort should be made to maintain the accuracy of the figures used in the compilation of the BTMC Monthly Production Report. To our knowledge too much AVOIDABLE lost production time is included in the stoppages which are used to calculate "Capacity Utilisation" and have the effect of concealing poor management performance and increasing the stated production per running spindle against target, albeit at the expense of lower utilisation which is then accepted or overlooked. This report is the most effective tool that the BTMC Directorate has, to scrutinise and control the performance of its production units. Taken at face value this is an excellent document and can give advance warning of pending difficulties at particular mills. Additional resources can then be drafted in to overcome the problems diagnosed.

5.2. MANAGEMENT

The justification for the too frequent changes and transfers of mill management needs to be examined. The efforts of a mill manager may be better judged over longer periods than the present average of 2 - 3 years, unless a manager is clearly shown to be incompetant. We believe the present system of frequent changes has contributed to the decline of certain mills.

5.3. COTTON MIXING

More control is necessary over cotton mixings, both the number and characteristics of the bales used, and the addition of waste. This control should be exercised throughout the 24 hour production period of each day to prevent fluctuations in spinning performance.

5.4. QUALITY CONTROL

Better liaison is required between quality controllers and mill management, and they should be made jointly responsible for the maintenance of quality.
The present system appears to exonerate the quality controllers from any subsequent responsibility, once they have recorded their tested results. They should be made responsible for analysing the reasons for any variance from standard and should be actively required to assist management in the implementation of the necessary corrections.
It should also be part of a quality controller's function to be inquisitive and constantly looking for, and experimenting with, improved methods of processing, rather than the preservation of the present status quo.

5.5. MACHINE PRODUCTIVITY

Because of the high cost of machinery and spare parts to Bangladesh as a country, every effort should be made to minimise the amount of machinery needed by the attainment of high machine productivity, even if this results in lower labour productivity.
Perseverance with the local production of spare parts should be persued vigorously, to reduce the need for dependence on foreign currency, even if this does lead to initial disappointments with the quality of the parts produced.

5.6. B.M.R. IMPLEMENTATION

We recommend that help be sought at the time of the actual implementation of the BMR projects to optimise the benefits of the programme. In this context it can be pointed out that UNIDO has the necessary competence to assist in this direction, having already undertaken the necessary technical appraisal work in the mills concerned.

6.0 ACKNOWLEDGEMENTS

We acknowledge the unfailing courtesy, understanding, help and hospitality extended to us throughout the project by the Directorate and the Management of the BTMC.

PRODUCTION ANALYSIS

APPENDIX 1

MILLS (R-Running Spindles, I-Installed Spindles)	APRIL 1981			JULY 1981			OCTOBER 1981			FEBRUARY 1982		
	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce
AHMED BAWANI TEX	2.17	76	1.65	2.04	74	1.51	1.89	69	1.30	2.19	57	1.25
Al-HAJ TEXTILE	2.40	72	1.73	2.60	87	2.26	2.05	73	1.49	2.35	56	1.32
AMIN TEX.MILLS	2.30	89	2.05	2.27	87	1.97	2.02	85	1.72	2.12	94	1.99
ASHRAF TEX.MILLS	2.48	94	2.33	2.18	75	1.64	2.25	76	1.71	2.11	84	1.77
ASIATIC COTTON	1.94	89	1.64	2.10	83	1.74	2.12	83	1.76	2.40	59	1.42
AFSAR COT.MILLS	2.15	69	1.48	2.40	97	2.33	2.01	91	1.83	2.12	94	1.99
BENGAL COTTON	2.75	85	2.34	2.80	93	2.60	2.74	90	2.47	3.02	85	2.56
BOGRA COTTON	2.05	93	1.91	2.04	90	1.84	2.16	88	1.90	2.16	58	1.25
BANGLADESH TEX	1.73	56	0.97	1.74	74	1.29	1.80	83	1.49	1.53	69	1.06
BARISAL TEXTILE	2.41	45	1.08	2.61	70	1.83	2.88	59	1.70	2.87	51	1.46
CHAND TEXTILE	2.70	92	2.48	2.61	81	2.11	2.63	67	1.76	2.50	67	1.68
CHISTY TEXTILE	2.30	77	1.77	2.25	76	1.71	2.26	80	1.81	1.99	59	1.17
CALICO COTTON	2.21	77	1.70	1.88	73	1.37	2.21	72	1.59	2.13	67	1.43
CHITTARANJAN	2.32	91	2.11	2.35	73	1.72	2.38	94	2.24	2.34	92	2.15
CHITTAGONG TEX	2.15	95	2.04	2.00	88	1.76	2.00	85	1.70	2.08	58	1.21
DHAKA COTTON	2.50	94	2.35	2.65	94	2.49	2.64	92	2.43	2.52	62	1.56
D.C.M. NO. 1	2.15	66	1.42	1.80	63	1.13	2.10	58	1.22	-	-	-
D.C.M. NO. 2	1.80	55	0.99	1.80	53	0.95	1.86	43	0.80	-	-	-
DOST TEXTILE	2.00	78	1.56	2.08	79	1.64	2.22	77	1.71	2.08	59	1.23
DARWANI TEXTILE	2.91	56	1.63	2.69	75	2.02	2.95	80	2.36	2.92	61	1.78
DINAJPUR TEX	2.54	70	1.78	2.19	67	1.47	2.30	63	1.45	2.50	52	1.30
EAGLE STAR TEX	3.19	92	2.93	2.75	73	2.00	2.60	95	2.47	2.44	58	1.42
FINE COTTON	2.78	90	2.50	2.35	58	1.36	3.00	89	2.67	2.88	89	2.56
GAWSIA COTTON	1.90	44	0.84	1.56	73	1.14	2.00	63	1.26	2.14	62	1.33
GOALUNDO TEX	2.92	60	1.25	2.86	68	1.94	3.07	85	2.61	2.80	56	1.57
HALIMA TEXTILES	2.00	91	1.82	2.00	83	1.66	2.08	85	1.77	1.98	79	1.56
HABIBUR RAHMAN	3.04	78	2.37	3.08	81	2.49	3.16	88	2.78	3.19	69	2.20
IBRAHIM COTTON	2.57	81	2.08	2.39	73	1.74	2.52	88	2.22	2.23	78	1.74
JALIL TEXTILE	2.60	91	2.37	2.48	83	2.06	2.72	89	2.42	2.54	69	1.75

MILLS (R-Running Spindles, I-Installed Spindles)	JUNE 1982			SEPTEMBER 1982			FEBRUARY 1983			JUNE 1983			OCTOBER 1983		
	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce
AHMED BAWANI TEX	2.02	61	1.23	2.40	84	2.02	2.13	80	1.70	2.14	79	1.69	2.28	84	[illegible]
Al-HAJ TEXTILE	2.16	72	1.56	2.50	75	1.88	-	-	-	-	-	-	-	-	-
AMIN TEX.MILLS	2.17	94	2.04	2.70	94	2.54	2.76	94	2.59	2.54	81	2.06	2.72	91	[illegible]
ASHRAF TEX.MILLS	2.09	89	1.86	2.34	95	2.22	-	-	-	-	-	-	-	-	-
ASIATIC COTTON	2.43	48	1.67	2.19	86	1.88	-	-	-	-	-	-	-	-	-
AFSAR COT.MILLS	2.00	86	1.72	2.27	93	2.11	-	-	-	-	-	-	-	-	-
BENGAL COTTON	2.96	96	2.84	3.04	93	2.83	3.06	91	2.78	3.06	93	2.85	3.09	91	[illegible]
BOGRA COTTON	2.15	94	2.02	2.17	96	2.08	-	-	-	-	-	-	-	-	-
BANGLADESH TEX	1.72	88	1.51	1.69	96	1.62	2.07	95	1.97	2.11	95	2.00	2.39	95	[illegible]
BARISAL TEXTILE	2.86	49	1.40	2.74	69	1.89	2.82	92	2.59	2.39	80	1.91	2.45	83	[illegible]
CHAND TEXTILE	2.61	72	1.88	2.66	90	2.39	-	-	-	-	-	-	-	-	-
CHISTY TEXTILE	2.34	92	2.15	2.32	89	2.06	2.28	77	1.76	2.22	79	1.75	2.42	93	[illegible]
CALICO COTTON	2.09	77	1.61	1.88	76	1.43	-	-	-	-	-	-	-	-	-
CHITTARANJAN	2.25	91	2.05	2.44	92	2.24	2.30	89	2.05	2.43	95	2.31	2.52	94	[illegible]
CHITTAGONG TEX	2.01	65	1.31	2.10	88	1.85	-	-	-	-	-	-	-	-	-
DHAKA COTTON	2.44	82	2.00	2.54	93	2.36	2.97	90	2.67	2.51	87	2.18	2.60	88	[illegible]
D.C.M. NO. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D.C.M. NO. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DOST TEXTILE	2.38	90	2.14	2.41	93	2.24	2.33	91	2.12	2.54	92	2.34	2.59	96	[illegible]
DARWANI TEXTILE	3.07	90	2.76	3.07	87	2.67	3.33	91	3.03	3.37	96	3.24	3.20	96	[illegible]
DINAJPUR TEX	2.57	83	2.13	2.61	74	1.93	2.88	81	2.33	2.85	82	2.34	2.61	81	[illegible]
EAGLE STAR TEX	2.51	73	1.83	2.83	92	2.60	2.89	88	2.54	2.88	80	2.30	2.85	92	[illegible]
FINE COTTON	2.30	91	2.09	2.76	94	2.59	3.00	96	2.88	2.67	91	2.43	2.58	92	[illegible]
GAWSIA COTTON	2.11	47	0.99	2.19	51	1.12	-	-	-	-	-	-	-	-	-
GOALUNDO TEX	2.80	86	2.40	3.01	86	2.59	-	-	-	-	-	-	-	-	-
HALIMA TEXTILES	2.00	83	1.66	2.13	85	1.81	-	-	-	-	-	-	-	-	-
HABIBUR RAHMAN	3.01	93	2.80	3.33	[illegible]	3.16	-	-	-	-	-	-	-	-	-
IBRAHIM COTTON	2.11	78	1.65	2.28	88	2.00	-	-	-	-	-	-	-	-	-
JALIL TEXTILE	2.59	69	1.79	2.67	84	2.24	-	-	-	-	-	-	-	-	-

cont/

PRODUCTION ANALYSIS

APPENDIX 1 (cont.)

MILLS R-Running Spindles I-Installed Spindles	APRIL 1981			JULY 1981			OCTOBER 1981			FEBRUARY 1982			JUNE 1982		
	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce
JABA TEXTILES	2.20	65	1.43	2.04	65	1.33	2.48	67	1.66	2.36	60	1.42	2.07	65	1.35
KULNA TEXTILE	2.66	82	2.31	2.82	86	2.43	2.70	93	2.51	2.83	84	2.38	2.34	83	1.94
KOKIL TEXTILE	2.32	78	1.81	2.37	70	1.66	1.80	73	1.31	2.82	59	1.66	2.22	73	1.62
KUSHTIA TEXTILE	2.75	78	2.15	2.70	78	2.11	2.55	67	1.71	2.53	73	1.85	2.23	80	1.78
KOHINEER SPINNING	2.99	79	2.36	3.15	74	2.33	2.73	74	2.02	2.94	85	2.50	2.95	81	2.39
KISHERGANJ TEX	2.95	56	1.65	2.53	72	1.82	2.45	67	1.64	1.93	45	0.87	2.47	58	1.43
LUXMINARAYAN COT	2.42	86	2.08	2.41	79	1.90	2.47	92	2.27	2.46	88	2.16	2.51	90	2.26
MOHINI MILLS	1.70	79	1.34	1.98	81	1.60	2.10	81	1.70	-	-	-	-	-	-
MONNOO TEXTILE MONNOO EXPANSION	2.28	93	2.12	2.00	53	1.06	2.01	77	1.55	2.27 1.50	87 72	1.97 1.08	1.76 2.37	86 77	1.51 1.82
MUSLIN COTTON	1.75	70	1.23	2.15	85	1.83	1.96	89	1.74	1.97	64	1.26	2.03	74	1.50
MEGHNA TEXTILE	2.46	81	1.98	2.25	70	1.58	2.30	66	1.52	2.17	64	1.39	2.37	70	1.66
MOWLA TEXTILE	2.60	88	2.29	2.60	88	2.29	2.70	84	2.27	2.72	81	2.20	2.32	76	1.76
MAINAMATI TEX	2.19	71	1.55	1.92	78	1.49	1.97	85	1.67	2.12	84	1.78	2.13	77	1.64
NATIONAL COTTON	2.85	95	1.95	2.05	93	1.91	2.02	95	1.92	1.98	5	0.10	-	-	-
OLYMPIA TEXTILE	2.05	85	1.74	1.68	76	1.28	2.02	86	1.74	2.03	80	1.62	1.93	80	1.54
ORIENT TEXTILES	2.68	88	2.36	2.74	85	2.33	2.76	91	2.51	2.62	49	1.28	3.04	64	1.95
PAHARTALI TEX	2.45	88	2.16	2.30	86	1.98	2.42	88	2.13	2.50	66	1.65	2.26	78	1.76
QUADERIA TEX	2.46	88	2.16	2.35	77	1.81	2.67	69	1.84	2.63	65	1.71	2.34	66	1.54
QUASEM COTTON	3.00	96	2.88	2.82	90	2.54	2.79	91	2.54	3.00	97	2.91	2.44	93	2.27
R. R. TEXTILE	2.70	96	2.59	2.90	88	2.55	2.90	96	2.78	2.76	90	2.48	2.85	94	2.68
RAZ TEXTILE	3.07	75	2.30	3.11	91	2.82	3.17	89	2.82	3.06	49	1.50	3.20	81	2.59
RAJSHAHI TEXTILE RANGAMATI	2.75	64	1.76	3.05	64	1.95	2.82	57	1.61	2.86	33	0.94	2.65	53	1.40
SATRANG TEXTILE	2.41	95	2.29	2.10	83	1.74	2.10	80	1.68	2.35	87	2.04	2.02	91	1.84
SHARMIN TEXTILE SUNDERBAN TEX	2.25	65	1.46	2.20	69	1.52	2.40	74	1.78	2.37	60	1.42	2.41	59	1.42
SERAJGANJ TEX	2.41	93	2.24	2.02	91	1.84	2.34	95	2.22	2.11	73	1.54	2.28	89	2.03
TANGAIL COTTON TANGAIL EXPANSION	2.62	90	2.40	2.55	88	2.24	2.04	84	1.71	2.78	94	2.61	2.64 2.86	32 48	0.84 1.37
ZEENAT TEXTILE	2.20	90	1.98	1.61	88	1.42	2.13	69	1.47	2.18	55	1.20	2.33	70	1.63
TOTAL	2.42	79	1.91	2.34	78	1.83	2.38	79	1.88	2.40	67	1.61	2.38	75	1.78

MILLS R-Running Spindles I-Installed Spindles	SEPTEMBER 1982			FEBRUARY 1983			JUNE 1983			OCTOBER 1983		
	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce	Prod/Spdl/Shift (R) ounce	% Util-isa-tion	Prod/Spdl/Shift (I) ounce
JABA TEXTILES	1.98	93	1.84	-	-	-	-	-	-	-	-	-
KULNA TEXTILE	2.48	94	2.33	2.41	85	2.05	2.41	84	2.02	2.51	92	2.31
KOKIL TEXTILE	2.50	89	2.23	2.30	90	2.07	2.32	87	2.02	2.34	89	2.08
KUSHTIA TEXTILE	2.48	78	1.93	-	-	-	-	-	-	-	-	-
KOHINEER SPINNING	3.04	87	2.64	2.92	88	2.57	2.83	89	2.52	2.92	91	2.77
KISHERGANJ TEX	2.64	81	2.14	2.55	87	2.22	2.79	95	2.65	2.69	96	2.58
LUXMINARAYAN COT	2.54	97	2.46	2.53	95	2.40	2.48	87	2.16	2.55	91	2.32
MOHINI MILLS	-	-	-	-	-	-	-	-	-	-	-	-
MONNOO TEXTILE MONNOO EXPANSION	2.28 2.29	93 85	2.12 1.95	2.42 2.84	94 78	2.27 2.22	2.23 2.74	88 76	1.96 2.08	2.25 2.74	91 83	2.05 2.27
MUSLIN COTTON	2.08	86	1.78	-	-	-	-	-	-	-	-	-
MEGHNA TEXTILE	2.56	93	2.38	2.42	94	2.27	2.52	92	2.32	2.50	93	2.35
MOWLA TEXTILE	2.62	86	2.25	-	-	-	-	-	-	-	-	-
MAINAMATI TEX	2.19	91	1.99	-	-	-	-	-	-	-	-	-
NATIONAL COTTON	-	-	-	-	-	-	-	-	-	2.45	85	-
OLYMPIA TEXTILE	2.14	93	1.99	2.10	93	1.95	1.94	88	1.71	2.10	89	1.87
ORIENT TEXTILES	2.42	93	2.25	2.59	91	2.36	2.54	85	2.16	2.71	92	2.49
PAHARTALI TEX	2.26	86	1.94	2.06	83	1.71	2.35	79	1.86	2.43	80	1.94
QUADERIA TEX	2.39	88	2.10	2.36	93	2.19	2.33	85	1.98	[illegible]	86	2.09
QUASEM COTTON	3.02	96	2.30	-	-	-	-	-	-	-	-	-
R. R. TEXTILE	2.80	96	2.69	2.90	97	-	3.05	95	2.89	3.10	98	3.04
RAZ TEXTILE	3.23	86	2.78	-	-	-	-	-	-	-	-	-
RAJSHAHI TEXTILE RANGAMATI	2.66	77	2.05	2.54	93	2.81	2.49	90	2.24	2.54 2.43	92 72	2.44 1.74
SATRANG TEXTILE	2.57	93	2.39	2.30	94	2.16	2.24	95	2.13	2.54	89	2.26
SHARMIN TEXTILE SUNDERBAN TEX	2.48	62	1.54	2.20	82	1.80	2.08	83	1.73	2.23 2.96	78 66	1.74 1.79
SERAJGANJ TEX	2.03	90	1.83	-	-	-	-	-	-	-	-	-
TANGAIL COTTON TANGAIL EXPANSION	2.46 2.53	83 66	2.04 1.67	2.65 2.84	83 87	2.20 2.42	2.47 2.58	82 83	2.03 2.14	2.29 2.29	88 89	2.46 2.48
ZEENAT TEXTILE	2.21	86	1.90	2.38	90	2.14	2.13	89	1.89	2.30	82	1.89
TOTAL	2.48	86	2.13	2.56	89	2.28	2.51	82	2.18	2.59	88	2.28

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
1. Ashraf Cotton Mills	Platt-1[illegible]	Platt-1[illegible]	Platt-1[illegible]
2. Afzal Cotton Mills	SACO-LOWELL-1[illegible]	SACO-LOWELL-1[illegible]	SACO-LOWELL-1[illegible]
3. Ahmed Bawany Textile Mills	Howa-1[illegible] Platt-1[illegible] Saco Lowell-1[illegible]	Howa-1[illegible] Platt-1[illegible]	Howa-1[illegible] [illegible]
4. Al-Haj Textile Mills	Toyoda-1[illegible] Platt-1[illegible]	Toyoda-1[illegible] Platt-1[illegible]	Toyoda-1[illegible] [illegible]
5. Alim Textile Mills	Toyoda-1[illegible]	Toyoda-1[illegible]	Toyoda-1[illegible]
6. Ashraf Textile Mills	Howa-1962 Platt-1[illegible]	Howa-1962 Platt-1[illegible]	Howa-1962 Platt-1[illegible] Zinser-1[illegible]
7. Asiatic Cotton Mills	Platt-1970 Ishikawa-1954 & 1955	Platt-1970 Ishikawa-1954 & 55	Platt-1[illegible] Ishikawa-1954 & 55
8. Bangladesh Textile Mills	Ishikawa-1954	Ishikawa-1954	Ishikawa-1954
9. Barisal Textile Mills	BTC-1976	BERIEA-1975	BERIEA-1975
10. Bengal Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962
11. Burma Cotton Mills	HOWA-1954	HOWA-1954	HOWA-1954
12. Calico Cotton Mills	Platt-1968	Platt-1968	Platt-1968
13. Chand Textile Mills	Toyoda-1958 & 68	Toyoda-1958, 61, 62 & 68	Toyoda-1[illegible], [illegible], [illegible] & 68
14. Chisty Textile Mills	HOWA-1965	HOWA-1965	HOWA-1965
15. Chittagong Textile Mills	HOWA-1954, 55 & 62	HOWA-1954, 55 & 62	HOWA-1954, 55 & 62
16. Chittaranjan Cotton Mills	Toyoda-1951 Platt-1945 ITR-1936	Toyoda-1940 Platt-19[illegible] L.T.R - 1936 C.I.F - 1950	C.I.F-1950
17. Dacca Cotton Mills	Toyoda-1954, 59 & 62	Toyoda-1954, 59, 62 & 63	Toyoda-1[illegible], [illegible]
18. Darwani Textile Mills	CTTCRI-1970	HOWA-1977	TOYODA-1[illegible]
19. Dhakeswari Cotton Mills-I	H & B-1935 & 37	H & B-1[illegible], 35, 37 & 37	H & B-1[illegible], [illegible], [illegible] & 37
20. Dhakeswari Cotton Mills-II	H & B-1937	H & B-1937	H & B-1937
21. Dinajpur Textile Mills	Luxmi-Reiter-1926	MTC-1926 Luxmi-Reiter-1926	Luxmi-Reiter-1[illegible]
22. Dost Textile Mills	Toyoda-1964	Toyoda-1964	Toyoda-1964
23. Eagle Star Textile	HOWA-1971	HOWA-1971	HOWA-1971
24. Fine Cotton Mills	Toyoda-1961	Toyoda-1961	Toyoda-1961
25. Gazaria Cotton Mills	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-1[illegible]
26. Ispahani Textile Mills	HOWA-1971	HOWA-1971	HOWA-1971
27. Habibur Rahman Textile Mills	Toyoda-1[illegible]	Toyoda-1[illegible]	Toyoda-1[illegible]
28. Helima Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962
29. Ibrahim Cotton Mills	HOWA-1[illegible]	HOWA-1962	HOWA-1[illegible]
30. Jute Textile Mills	OTE-1[illegible]	OTE-1[illegible]	OTE-1[illegible]

BANGLADESH TEXTILE MILLS CORPORATION

OPERATION DIRECTORATE

Following Make and Model of Textile Machinery in B.T.M.C. Mills

(A Project Survey)

S.No.	Name of the Mills	Blow Room Machinery	Carding Machine	Drawing Machine
31.	Jalil Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962
32.	Khulna Textile Mills	Toyoda-1966	HOWA-1962 CHI-1955	HOWA-1962
33.	Kishoreganj Textile Mills	Toyoda-1965	HOWA-1965	HOWA-1965
34.	Kohinoor Spinning Mills	HERBERT-1965	MAG-1966	PLATT SACO LOWELL-1966 (BL)
35.	Kohil Textile Mills	Toyoda-1962	Toyoda-1964	Toyoda-1964
36.	Kushtia Textile Mills	Toyoda-1971	Platt-1971	Platt-1971
37.	Laxminarayan Cotton Mills	H & B-1937 CHI-1949	H & B-1937 CHI-1945	MAG-1938 H&B-1937 CHI-1940
38.	Mainamati Textile Mills	HOWA-1965	HOWA-1965	HOWA-1965
39.	Meghna Textile Mills	Toyoda-1962	Toyoda-1962	Toyoda-1962
40.	Mohini Cotton Mills	H & B-1928	H & B-1928	H & B-1928
41.	Monnoo Textile Mills	Ishikawa-1960	Ishikawa-1960	Ishikawa-1960
42.	Nawla Textile Mills	Platt-1968	Platt-1968	Platt-1968
43.	Nurlin Cotton Mills	Toyoda-1962	Toyoda-1958 & 62	Toyoda-1962
44.	National Cotton Mills	Platt-1946	Platt-1947 & 54	Platt-1947 & 54
45.	Olympia Textile Mills	Ishikawa-1962 & 63 O.K.K-1954	Ishikawa-1951 & 54 O.K.K-1954 & 55	Ishikawa-1954 O.K.K-1954
46.	Orient Textile Mills	Toyoda-1962	Toyoda-1962 & 63	Toyoda-1962
47.	Pahartali Textile Mills	HOWA-1954 & 62	HOWA-1954 & 62	HOWA-1954 & 62
48.	Quaderia Textile Mills	Toyoda-1962	Toyoda-1962	Toyoda-1962
49.	Qumeer Cotton Mills	HOWA-1971	HOWA-1971	HOWA-1971 & 72
50.	Rajshahi Textile Mills	DSE	LMG-1976	LMG-1976
51.	R. R. Textile Mills	Toyoda-1964	Toyoda-1964 & 65	Toyoda-1964 & 65
52.	Ray Textile Mills	HOWA-1971	HOWA-1971	HOWA-1971
53.	Satrang Textile Mills	-	HOWA-1964	-
54.	Serajgonj Spinning Mills	Ishikawa-1963	Ishikawa-1963	Ishikawa-1963
55.	Sharmin Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962
56.	Tanzeil Cotton Mills	Toyoda-1962	Toyoda-1962	Toyoda-1962
57.	Zeenat Textile Mills	Implextedt-1954 & 55	Implextedt-1954 & 55	Implextedt-1954 & 55

BANGLADESH TEXTILE MILLS CORPORATION

OPERATION DIRECTORATE

List wise Info and Model of Textile Machinery in B.T.M.C. Mills

(As on 1.6.1974)

S/No.	Name of the Mills	Pre-Carding Machine	Combing Machine	Speed Frames	Ring Frames
1.	Adamjee Cotton Mills	Nil	Nil	Platt-1936 & 1937 H & B-1965	[illegible]
2.	Afser Cotton Mills	SACO-LOWELL-1970	SACO-LOWELL-1970	SACO-LOWELL	SACO-LOWELL-1
3.	Ahmed Bawany Textile Mills	HOWA-1955 Whitin-1964	HOWA-1955 Whitin-1964	HOWA-1955 Platt(U.S.)	[illegible] Platt [illegible] Platt.
4.	Al-Haj Textile Mills	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-[illegible]	Toyoda-1[illegible] Platt-[illegible]
5.	Amin Textile Mills	Toyoda-1962	Toyoda-1962	Toyoda-1962	Toyoda-1[illegible]
6.	Ashraf Textile Mills	HOWA-1962 Platt-1968	HOWA-1962 Platt-1968	HOWA-1962 Platt-1968 Zinser-1965	HOWA-1[illegible] Platt-1[illegible]
7.	Asiatic Cotton Mills	Platt-1970 Tokai-1965	Platt-1970 Tokai-1965	Platt-1970 Ishikawa-1954 & 55	Platt-1[illegible] Ishikawa-1954 & 55
8.	Bangladesh Textile Mills	Nil	Nil	Ishikawa-1954	Ishikawa-1954 Zinser-1[illegible] Toyoda-1[illegible]
9.	Barisal Textile Mills	Nil	Nil	TEC-1976	TOWA-1[illegible]
10.	Bengal Textile Mills	Nil	Nil	HOWA-1962	HOWA-1[illegible]
11.	Bogra Cotton Mills	HOWA-1960	HOWA-1960	HOWA-1954 & 60	HOWA-1[illegible] & 60
12.	Calico Cotton Mills	Platt-1968	Platt-1968	Platt-1968	Platt-1[illegible]
13.	Chand Textile Mills	Tokai-1958, 63, & 68	Tokai-1958, 62, 63 & 68	Toyoda-1958, 61,62 & 63	Toyoda-1[illegible],61,[illegible] & [illegible]
14.	Chiaty Textile Mills	Nil	Nil	HOWA-1965	HOWA-1[illegible]
15.	Chittagong Textile Mills	HOWA-1962	HOWA-1962	HOWA-1954,55 & 62	HOWA-1[illegible], 55 & 62
16.	Chittaranjan Cotton Mills	Platt-1966 O.E.K. 1950	Platt-1966 O.E.K. 1950	Toyoda-1[illegible] Platt-1[illegible] L.T.B-1[illegible] O.E.K. 1[illegible] & 1950	Toyoda-1[illegible] H & B L.T.B-1[illegible] O.E.K-1[illegible] & 1[illegible]
17.	Dacca Cotton Mills	Toyoda-1960 & 61	Toyoda-1961 & 62	Toyoda-1954,58,60 & 63	Toyoda-1[illegible],[illegible], [illegible] & [illegible]
18.	Darwani Textile Mills	Toyoda-1978	Toyoda-1978	HOWA-1975	HOWA-1[illegible]
19.	Dhakeswari Cotton Mills I	Nil	Nil	H & B-1925 & 27	H & B-1[illegible], 2 & [illegible]
20.	Dhakeswari Cotton Mills II	Reiter-1937	Reiter-1937	H & B-1937	H & B-1[illegible]
21.	Dinajpur Textile Mills	Luxmi-Reiter-1976	Luxmi-Reiter-1976	Luxmi-Reiter-1976	Luxmi-Reiter-1[illegible]
22.	Dost Textile Mills	Nil	Nil	Toyoda-1966	Toyoda-1[illegible]
23.	Eagle Star Textile Mills	Nil	Nil	HOWA-1971	Toyoda-1[illegible] [illegible]-1[illegible]
24.	Fine Cotton Mills	Toyoda-1961	Toyoda-1961	Toyoda-1961	Toyoda-1[illegible]
25.	Gazia Cotton Mills	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-1968	Toyoda-1961 Platt-1[illegible]	Toyoda-1[illegible] Platt-1[illegible]
26.	Godrej Textile Mills	Nil	Nil	HOWA-1971	HOWA-1[illegible]
27.	Ishibar Rahman Textile Mills	Nil	Nil	Toyoda-1[illegible]	Toyoda-1[illegible]

[illegible] TEXTILE MILLS [illegible]

SPECIFIC DIRECTORY

Information [illegible] and Model of Textile Machinery in B.T.I.C. Mills

[illegible]

Sl.	Name of the Mills	Pre-Carding Machine	Combing Machine	Speed Frames	Ring Frames
52.	Delil Textile Mills	Nil	Nil	HOWA-1966	[illegible]
53.	Dhaka Textile Mills	Nil	Nil	HOWA-1966 ORM-1966	[illegible]
54.	Elahorecony Textile Mills	Nil	Nil	HOWA-1975	[illegible]
55.	Fahimoor Spinning Mills	Toyoda-1975	Toyoda-1975	SACO-LOWELL-1967	[illegible]
56.	Fakil Textile Mills	Nil	Nil	Toyoda-1964	[illegible]
57.	Fushtia Textile Mills	Platt-1971	Platt-1971	Platt-1971	[illegible]
58.	Ispahanyan Cotton Mills	Platt-1959	Platt-1959	H&B-1957 ORM-1966	[illegible]
59.	Jainagati Textile Mills	HOWA-1965	HOWA-1965	HOWA-1965	[illegible]
60.	Meghna Textile Mills	Nil	Nil	Toyoda-1966	[illegible]
61.	Mohini Cotton Mills	Nil	Nil	H&B-1965	[illegible]
62.	Monnoo Textile Mills	Nil	Nil	Ishikawa-1960	[illegible]
63.	Nowla Textile Mills	Platt-1968	Platt-1968	Platt-1968	[illegible]
64.	Nuslim Cotton Mills	HOWA-1965 Platt-1960 SACO-LOWELL-1960	HOWA-1965 Platt-1960	Toyoda-1952 & 62	[illegible]
65.	National Cotton Mills	Nil	Nil	Platt-1947 & 54	[illegible]
66.	Olympia Textile Mills	HOWA-1955 Platt-1955 O.K.K-1954	HOWA-1955 O.K.K-1955	Ishikawa-1954,56 & 63 O.K.K-1954	[illegible]
67.	Orient Textile Mills	Tokai-1963	Tokai-1963	Toyoda-1962	[illegible]
68.	Rahertoli Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962	[illegible]
69.	Quaderia Textile Mills	Toyoda-1962	Toyoda-1962	Toyoda-1962	[illegible]
70.	Quasem Cotton Mills	HOWA-1971 & 76	HOWA-1971 &76	HOWA-1971 &76	[illegible]
71.	Rajshahi Textile Mills	Nil	Nil	EMC-1976	[illegible]
72.	R. R. Textile Mills	HOWA-1965	Whitin-1954	Toyoda-1964	[illegible]
73.	Raz Textile Mills	Nil	Nil	HOWA-1971	[illegible]
74.	Satrang Textile Mills	Nil	Nil	HOWA-1964	[illegible]
75.	Serajgonj Spinning Mills	Ishikawa-1963	Ishikawa-1963	Ishikawa-1963	[illegible]
76.	Shermin Textile Mills	HOWA-1962	HOWA-1962	HOWA-1962	[illegible]
77.	Tongail Cotton Mills	Nil	Nil	Toyoda-1962	[illegible]
78.	Zeenat Textile Mills	Whitin-1962	Whitin-1962	Inglestadt-1954 & 58	[illegible]

APPENDIX 3

LIST OF THE MILLS UNDER BTMC WITH SPINDLES, DECEMBER 1983

	NAME OF UNIT	INSTALLED SPINDLES
1.	Ahmed Bawany Textile Mills	39,416
2.	Amin Textile Mills	18,400
3.	Bengal Textile Mills	12,400
4.	Bangladesh Textile Mills	18,000
5.	Barisal Textile Mills	25,056
6.	Chisty Textile Mills	15,120
7.	Chittarangan Cotton Mills	19,804
8.	Dhaka Cotton Mills	14,200
9.	Dost Textile Mills	12,800
10.	Darwani Textile Mills	24,624
11.	Dinajpur Textile Mills	25,056
12.	Eagle Star Textile Mills	20,736
13.	Fine Cotton Mills	12,400
14.	Khulna Textile Mills	12,448
15.	Kokil Textile Mills	14,800
16.	Kohinoor Spinning Mills	25,056
17.	Kisheregonje Textile Mills	23,000
18.	Luxminarayan Cotton Mills	15,172
19.	Monnoo Textile Mills	15,744
20.	Monnoo Expansion	12,500
21.	Meghna Textile Mills	15,120
22.	National Cotton Mills	15,880
23.	Olympia Textile Mills	32,736
24.	Orient Textile Mills	12,400
25.	Pahartali Textile Mills	30,400
26.	Quaderia Textile Mills	15,200
27.	R. R. Textile Mills	27,024
28.	Rangamati Textile Mills	11,664
29.	Rajshahi Textile Mills	25,058
30.	Satrang Textile Mills	12,000
31.	Sharmin Textile Mills	12,400
32.	Tangail Cotton Mills	12,400
33.	Tangail Expansion	12,500
34.	Zeenat Textile Mills	25,200
35.	Sylhet Textile Mills	25,056
36.	Sunderban Textile Mills	25,000
	TOTAL	686,770

APPENDIX 3
(cont.)

LIST OF THE TEXTILE MILLS DENATIONALISED FROM BTMC IN JANUARY 1983

	NAME OF UNIT	INSTALLED SPINDLES
1.	Ashraf Textile Mills, Tongi	24,880
2.	Asiatic Cotton Mills, Ctg.	26,608
3.	Alhaj Textile Mills, Ishardi	27,200
4.	Bogura Cotton Spinning Co. Ltd.	19,600
5.	Chand Textile Mills Ltd., Dhaka	29,800
6.	Chittagong Textile Mills Ltd.	37,200
7.	Gawsia Cotton Spinning Mills Ltd.	23,920
8.	Ibrahim Cotton Mills Ltd., Ctg.	12,400
9.	Jaba Textile Mills Ltd.	12,400
10.	Jalil Textile Mills Ltd.	12,400
11.	Moinamati Textile Mills	12,400
12.	Muslin Cotton Mills	45,400
13.	Mowla Textile Mills	12,480
14.	Quashem Cotton Mills Ltd.	12,096
15.	Halima Textile Mills Ltd.	12,400
16.	Shirajgonje Cotton Spinning Mills	12,400
17.	Raj Textile Mills	12,528
18.	Calico Cotton Mills	12,480
19.	Afsar Cotton Mills	12,000
20.	Kushtia Textile Mills	12,000
21.	Habibur Rahman Textile Mills	12,768
22.	Gualunda Textile Mills	12,528
	Total spindles denationalised = 407,888	
	Total spindles remaining under BTMC up to December 1983 = 686,770	
	TOTAL	407,888