



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

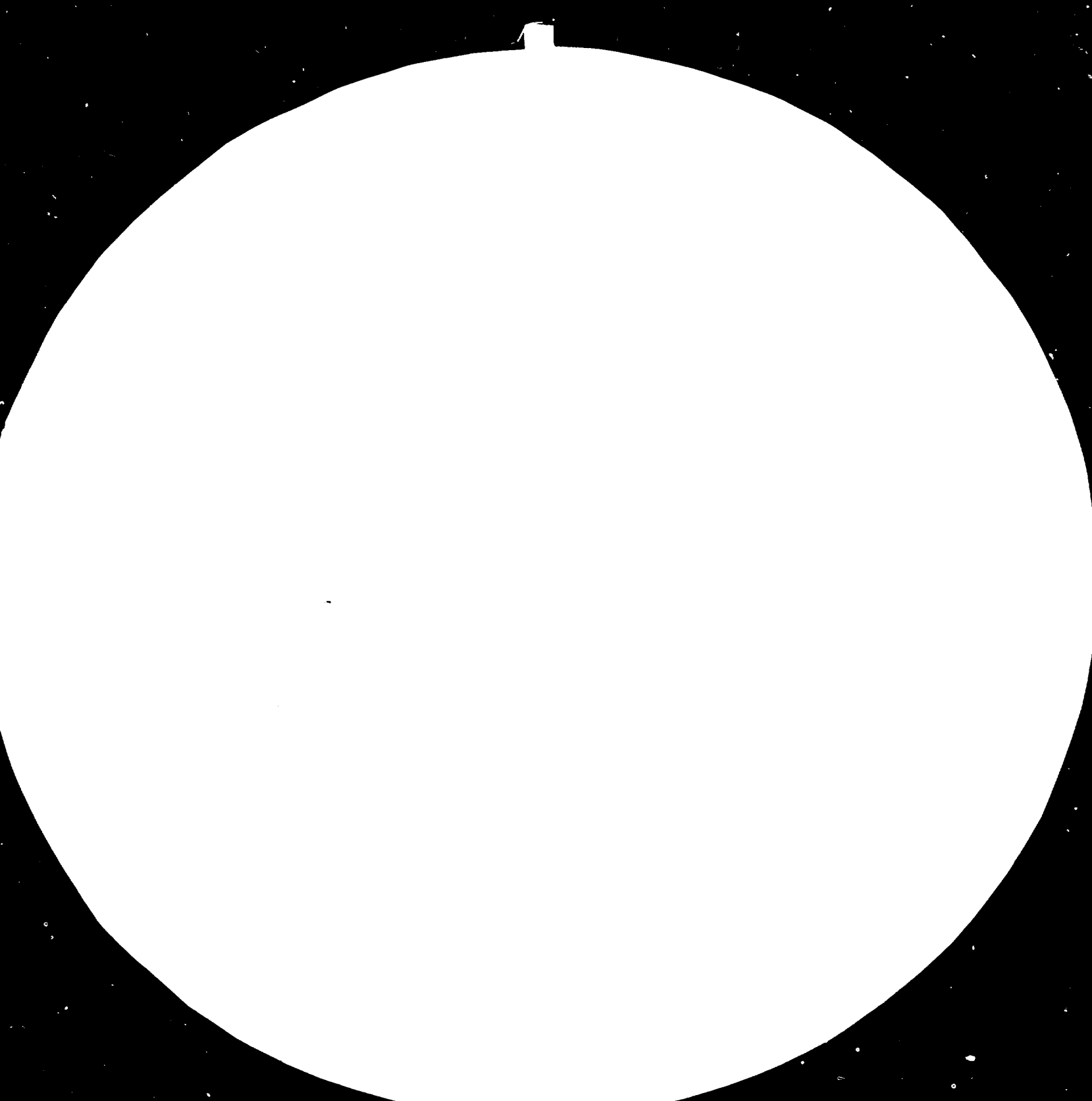
FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org





4.0



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

RESTRICTED

13076

DP/ID/SER.A/479
28 October 1983
English

TEXTILE INDUSTRY DEVELOPMENT PROGRAMME

DP/BGD/82/006

BANGLADESH .

Technical Report: Assistance to the weaving sector *

Prepared for the Government of Bangladesh
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of John Redmond, Weaving Adviser

United Nations Industrial Development Organization
Vienna

* This document has been reproduced without formal editing.

INDEX OF CONTENTS

Page

Project Resume	1
Duties	1
Action Plan	2
Findings	3
Results	4
Recommendations	5
a) Recommendations for consideration of BTMC	5
b) Recommendations for Government's considerations .	6
 <u>Appendices</u>	
Appendix 1 - BTMC mills with weaving units ..	7
2 - Work at BTMC	8
3 - Mills surveys	9
4 - Other work done	13
5 - List of counterparts	14

This is the final report covering my term of duty in Bangladesh at the Textile Industry Development Centre, Project No. DP/3GD/82/006 from October 1979 - September, 1983 as Weaving Adviser Operations.

Project Resume

At the time of arrival Bangladesh Textile Mills Corporation(BTMC) controlled over 60 mills with a proposal to increase the textile industry by setting up a further 25 mills during the next five years.

The textile mills were in a very depleted and weakened condition, the productivity low, with experienced trained personnel minimal, especially in the departments of textile production prior to weaving, weaving and quality control.

The Government of Bangladesh, aided by T.I.D.C., sought to explore the possibilities of improving the situation by (a) saturating the industry with trained personnel (b) producing quality parts and accessories and (c) up-grading the supervisory and management skills, so that the industry could meet the country's textile demands, attain self sufficiency, and enter the export market.

The development objective of the project is to increase the domestic production of cotton fabrics in Bangladesh by increasing the production of yarn and meeting the full requirements of the textile industry, both for the power loom and hand loom sections of the community. This in turn will create an increase in employment opportunities in rural areas and reduce the reliance on imported materials and goods.

Duties:

As a member of an international team of Textile experts covering all processes, i.e. spinning, intermediate processing, weaving, dyeing, printing, finishing, spare parts manufacture and workshop engineering, my responsibilities covered weaving operation activities, with the duties of:

1. Improving the productivity and quality of cloth production in the textile industry.
2. Offering advice on measures necessary to increase manpower, and machinery productivity in the weaving sectors.
3. Rationalization of the present production programme through standardisation of fabric construction and introducing fabric settings on the loom.
4. Increasing machine and worker productivity by introducing correct loom settings, designing machine gauges and improving work methods through corrective and preventive maintenance.

5. Introducing inter departmental quality control systems with the object of reducing the high percentage of low quality cloth produced in BTMC factories.
6. To co-ordinate technical training to operator and supervisory staff, followed up by operational implant assistance.
7. Analyse and prepare recommendation for the manufacture of spare parts and accessories considered possible to manufacture locally.
8. Initially to survey 16 selected mills considered important to the country's productivity.
9. Suggest systems for storage units, care of sizing ingredients, and handling storage and transportation of materials required for the weaving departments.
10. Prepare an introduction to " Methodology of preparation of and weaving of Cotton/Polyester yarn and fabrics "

Action Plan:

In order to correlate the data necessary to implement the plan of action, a fact finding survey was carried out, initially with the 16 designated mills and later with 10 more weaving units, to assess the nature of their production and to suggest possible methods for achieving the objectives.

In my report " Preliminary Survey of the 16 Selected Mills by BTMC ", Technical observations and recommendations were compiled. This text was used on a one day seminar, to which 120 representative of BTMC were invited which outlined the report, followed by discussions with the factory management on their individual production problems.

Work in the mills consisted of offering advice, giving instructions and demonstrations of production techniques, with the objective of increasing the productivity and improving the fabric quality. Many trials were carried out which included the testing of locally manufactured -

- (a) spare parts and accessories
- (b) various ingredients and sizing formulae
- (c) fabric settings for different cloth constructions

Together with my counterparts, we visited 26 BTMC weaving mills, six mills from the private sector, three hand loom weaving centres, and nine manufacturers of spare parts and accessories.

Findings:

1. Bangladesh with a population of close to 100 million is a country of low per capita consumption of cloth estimated at under 8 yards per year. In comparison, the current consumption in South East Asian countries ranges from 10-20 yards per capita per annum.
2. The handloom sector provided at the beginning of 1983 approximately 75% at all domestically produced available cloth, with BEMC supplying 15% with the remainder coming from the private sector and imports, however this balance will change as the BEMC reduces its monopoly and the private sector once more establishes itself.
3. At this time over 5000 power-looms are lying idle, due to shortage of spares, lack of skilled operators, or insufficient supply of materials. In order to meet the rising demands of cloth in the country, priority considerations must be given to these requirements and to reactivating this machinery.
4. The training methods and operational processing necessary to achieve the requirements are not sufficient to meet the demands of the industry. Automatic semi-automatic, and even non-automatic machinery demand skilled operators and quality processing methods.
5. Most of the weaving units are restricted in production by : insufficient materials supply; a shortage of essential spares; labour shortages, partially due to absenteeism.
6. By international standards the conditions in BEMC mills are unfavourable and not conducive to obtaining maximum worker outputs, the lighting systems are not satisfactory, the humidity and temperatures in the weaving departments, particularly in the rainy season, decreases the operators stamina and reduces outputs. Productivity is low, ratio of man per machine is high, absenteeism is high, management skills, technically and in production and marketing are inadequate and often there is a serious cash flow problem.
7. The purchasing policy and inventory system fails to meet the demands and in many cases machinery has been stopped, and consequently a loss in production, due to lack of spare parts and accessories.
8. There is an acute shortage of skilled workers and trained supervisory staff at all levels, and more particularly technical personnel capable of complete effective, corrective and preventative machine maintenance.

Results:

After the initial mills survey, recommendations were offered to the large mills with time and efforts directed particularly to Ahmed Bawany Textile Mills, Olympia Textiles Mills and Meghna Textile Mills.

During the project, by request from BTMC, work, recommendations, and some implementation was carried out at many other BTMC Mills and more recently textile units of the private sector.

Attention was directed towards covering factories having similar problems to each other and at the same time making concerted effort for factories with special production problems.

Implementation of recommendations was possible in 25% to 35% of the mills, however the follow-up of these recommendations was not continued in some of the mills, thereby reducing the value of the time and effort taken.

The work done at the mills can be divided into the following categories:

1. Fact finding related to machinery conditions.
2. Fact finding concerning processing methods.
3. Introducing operational assistance to overcome production anomalies.
4. Recommendations for updating machinery and introducing methods and systems for necessary maintenance programmes.
5. Recommendations to reactivate idle machinery and to balance production requirements.

Following up recommendations was often a tedious, frustrating, and unrewarding job, mainly due to the lack of management understanding of the importance of the items recommended for procurement, of the actual procurement policy of individual factories, of the low level of operator, technician skills and the lack of consideration given to warp and weft machinery, and their production methods. Other restrictions were due to frequent changes of senior staff and to the staffing policy.

Recommendations:

a) Recommendations for consideration of BTMC.

With the declared disinvestment policy of the government and implementation of the new industrial policy, the following points may be considered :

1. Balancing, Modernisation and Rehabilitation (BMR) Programmes for the back processing and weaving departments of the first five mills be implemented without delay.
2. Priority one must be the requirements of weaving back processing and to meet production requirements of the weaving department. Most of the warp and weft processing machineries are inadequate and their condition renders them unable to produce quality requirements.
3. Quality control programmes and cloth inspection systems must be introduced at Meghna Textile Mills, Pahartali Textile Mills and Ahmed Bawany Textiles.
4. Mini workshops inside the department where possible are conducive to reducing time losses in machine maintenance. In the past, and at present, neither simple workshop machinery, tools nor facilities are considered essential, yet the loss of production due to machine stopped time is considerable.
5. A large portion of the machinery is obsolete, and out-dated, consequently spare parts are not always available from overseas but can be manufactured locally, providing attention is given to tests and records. Similarly timber accessories can, and have been made locally, giving proven excellent results.
6. The production of cloth in Bangladesh is below requirements, therefore as a large percentage of machinery is lying idle serious consideration should be given for an evaluation of inactive machinery, and where possible ought to be repaired, renovated and put into operation.
7. Many of the skilled and semi-skilled textile workers are encouraged to go to the Middle East, thus manpower drain draws into the country foreign exchange, but seriously reduces the efficient productivity of the local industry. Measures should be taken to allow technical and skilled operators to move freely but at the same time ensure the Industry has sufficient personnel to continue efficient uninterrupted production.
8. The system popular in BTMC to switch senior management and supervisory staff from mill to mill may have its benefits but certainly reduces continuity and often greatly contributes to a deterioration in personnel effectiveness, and overall productivity.

9. In-plant organised methodical training for weavers, maintenance workers and auxiliary workers is essential, either for individual mills or by zones. Generally, for one reason or another, up to 30% absenteeism is regularly recorded, therefore if the loss of production is to be reduced, additional trained operators have to be available.

b) Recommendations for government's consideration:

1. Garment manufacturers in Bangladesh use 40 million yards of imported cloth to produce and export garments to many overseas countries. Serious efforts should be made to discuss their high quality requirements and to supply them with Bangladesh produced quality cloth.
2. Irregular power supply and frequent power cuts cause heavy production losses and cause damage to machinery. Although work is being carried out, consideration should be given to installing individual generators to factories sufferings major production losses.
3. There is a serious shortage of skilled labour and experienced mechanical and technical staff in the industry. With the present expansion programme qualified labour would be at a premium and the general position could worsen. A labour requirement survey should be carried out to understand the EBB and flow of labour in the industry. The Government should incorporate the existing textile industries, colleges and development centres, with recommendations to make a joint effort to overcome the industries manpower deficiencies.
4. Consideration ought to be given to introducing expatriate factory management specialists, for limited periods of time. This not only would give the industry the required knowledge for up-grading the industry, but would also demonstrate the necessary time, effort, and determination required in managing a factory and, at the same time, ensure maximum involvement of senior management.

APPENDIX - 1

BPMC Mills With Weaving Units

			<u>LOCATION</u>
1.	Muslin Cotton Mills	- RPS	- Chittagong
2.	Ahmed Bawany Textile Mills	-	- Demra
3.	Olympia Textile Mills	-	- Tongi.
4.	Zeenat Textile Mills	-	- Tongi
5.	Meghna Textile Mills	-	- Tongi
6.	Karilin Silk Mills	-	- Chittagong
7.	Alhaj Textile Mills	- RPS	- Ishardi
8.	Pahartali Textile & Hosiery Mills	-	- Chittagong
9.	Chittagong Textile Mills	- RPS	- Chittagong
10.	Gawzia Cotton & Spinning Mills	- RPS	- Narayanganj
11.	Dhakeshwari Cotton Mill No. 1	- RPS	- "
12.	" " " No. 2	- RPS	- "
13.	Luxminarayan Cotton Mill	-	- "
14.	Chittaranjan " "	-	- "
15.	Sharmin Textile Mills	-	- "
16.	Chand Textile Mills	- RPS	- "
17.	Halima Textile Mills	- RPS	- Comilla
18.	Jalil Textile Mills	- RPS	- Chittagong
19.	Ibrahim Cotton Mills	- RPS	- "
20.	Mohini Cotton Mills	- RPS	- Kushtia
21.	Dhaka Cotton Mills	-	- Dhaka
22.	Adarsha Cotton Mills	- RPS	- Narayanganj
23.	Bogra Cotton & Spinning Mills	- RPS	- Bogra
24.	National Cotton Mills	-	- Chittagong
25.	Asiatic Cotton Mills	- RPS	- "
26.	Valika Woolen Mills	-	- "
27.	Khulna Textile Mills	-	- Khulna
28.	Bangladesh Textile Mills	-	- Narayanganj

R.P.S. = Return to Private Sector

Work at B.T.M.C.

1. Visited the designated 16 mills to make a personal introduction, discuss the objectives, correlate information on machinery conditions methods of processing, training and conditions, this information served to establish a plan of action for future development.
2. The surveys high lighted problems common to most mills, a study was prepared pointing out the problems and basic recommendations were introduced.
3. Local spare parts manufacturers located with arrangements made to manufacture essential spares required by the mills to activate preparation & weaving machinery. The parts were manufactured, tried, and tested, modifications done, further successful trials carried out in various factories and a checking system introduced together with a follow-up programmes to check the performance and values.
4. Selected Ahmed Bawany, Demra, as a pilot plant, introduced recommendations for weaving back processes, i.e. warping sizing, pirn winding, drawing in - reconditioned 120 looms to operate automatically which increased the production by over 20%.
5. Participated in studies for machinery requirements.
6. Prepared plan of action for the weaving units through out the country.
7. Surveyed Valika Woolen Mills and Karilin Silk Mills in order to prepare a product diversification study for these specialised mills.
8. Surveyed Eagle Star Mill and prepared reports for machinery requirements to add cloth production to the factory.
9. Recommendations prepared and given for methodical yarn clearer and yarn tension setting on warping machinery.
10. Cotton/Polyester sizing formulae prepared and distributed.
11. Prepared a study and distributed recommendations for loom settings.
12. Discussions and recommendations given to local manufacturers to improve the quality of wire reeds and shuttles.

MUSLIN COTTON MILLS

- Improved the production of the warping machinery by introducing uniform yarn packages and re-organising creeling systems, estimated 30% production increase.
- Advice was given to reduce excessive damage to pirns, by changing existing cleaning method and restarting mechanical pirn cleaning machine.
- Suggested possible increases for loom productivity by introducing correct settings.

AHMED BAWANY

- 1 - Recommended formula for selection, training, and promotion for weaving department operator's and staffs.
- 2 - Weaver training unit established to train effective operators in 6-8 weeks.
- 3 - Mechanics training unit formed with a trained Instructor to continue instruction and refresher courses on Sakamoto Loom Maintenance.
- 4 - Estimated time of theoretical instruction and shed practice - 4 to 6 months.
- 5 - Practical demonstrations and assistance to reactivate 120 looms to original automatic condition.
- 6 - Effective system to reduce damage to pirns during cleaning process, and machinery designed to effect the work automatically.
- 7 - Supervised Operational Training in Ahmed Bawany, and Bangladesh Textile Mills, Meghna Textiles, Pahartali Textile Mills, Adarsha Cotton Mills, arranged small training units equipped with looms, tools, spare parts, drawings and normal school equipment in each mill.
- 8 - Introduced recommendations for quality controls, and supervised the programmes, primarily to improve the quality of government orders.
- 9 - Prepared training programmes for Warp preparation and at Olympia Textile Mills, Zeenat Textile Mills and Meghna Textile Mills.
- 10 - Prepared a programme and initiated training on shuttle care and attention at Meghna Textile Mills, Zeenat Textile Mills and Olympia Textile Mills.
- 11 - Completely re-organised the weaving and preparation departments at Adarsha Cotton Mills, introduced a production flow system and initiated operational training programmes for operator's machines and supervisors.

- 12 - Presented detailed study of machinery requirements for the Balancing, Modernisation and Rehabilitation of Chittaranjan Cotton Mills, Ahmed Bawany, Olympia Textile Mills, Muslin Cotton Mills, Zeenat Textile Mills, Bogra Cotton & Spinning Company, Halima Textile, Luxminarayan Cotton Mills, Pahartali Cotton Mills.
- 13 - Introduced, organised methodical operational weaving training programme at Ahmed Bawany on a continuous basis.
- 14 - Recommended suitable lubricants.

Recommendations given to reduce yarn breakage rate and increase efficiency of the warping machine through correct work practices.

Instructions given on the sizing machine to increase the productivity and improve the quality of warps, through machine maintenance, roller surface scouring, instrument replacement a regulated steam supply and quality control system.

Recommended a system to change the drawing-in method and increase the output.

Prepared specifications for, and redesigned, high turn-over spares, to be manufactured at a reasonable price. Test, record and follow-up results.

Inaugurated cloth inspection system and quality control procedure.

OLYMPIA TEXTILE MILLS

Production trials were introduced for Cotton/Polyester single and double yarn with the intention of producing C/P cloth on non-automatic silk looms. This was not recommended as the trials proved conclusively that the production would be of a very low quality. Much more effective and positive was the result obtained on the automatic loom tests, however, the management did not continue with their production.

Sizing formulae for cotton and C/P blended yarn were introduced.

The sizing machine was semi overhauled and a new drainage system was recommended and successfully implemented, size mixing beck feed system improved, pressure and rollers improved, but no implementation of recommendations to reactivate moisture monitor, steam pressure gauges and other instruments were made.

An appreciation course on warp and weft processing was prepared and given to 16-20 instructors and supervisors.

Other papers prepared were. "Instructions on Sizing Machine Operations", "Method of rubber roller grinding", "recommended cotton/polyester size ingredients", "Shuttle care and attention" and "Sakamoto loom maintenance".

ZEEBAT TEXTILE MILLS

Re-organised cone winding section, construct permanent storage units for yarn packages. Introduced an effective cone, bobbin, and pirn clearing method through a creeling system.

Recommended a maintenance programme for pirn winding section.

Re-organise accessories storage areas for size ingredients, warps, healds and reeds.

Recommended action for reconditioning the sizing machine.

Recommendations for total re-organisation of the weaving department, cloth inspection area and scrap machinery areas.

MEGHNA TEXTILE MILLS

Recommendations to improve warping production through demonstration of correct machine and creel settings.

Established and implemented correct procedures for stripping without damaging the pirns.

Re-established automatic pirn winding maintenance programme.

Carried out several proven successful sizing trials with different formulas, both for cotton and Cotton/Polyester blended yarn. Re-activated air conditioning system. Established training programme for mechanics together with training school, loom and necessary equipment.

Introduced quality control and inspection systems for the weaving department giving special attention to Cotton/Polyester.

KARILYN SILK MILLS

A comprehensive feasibility study was carried out for diversifying production to Cotton/Polyester production with the existing machinery.

PARBATALI TEXTILE MILLS

Instructions given to utilise the pirn winding machine to maximum capacity together with preventative and corrective maintenance schedules.

Loom maintenance instructions and training programme inaugurated. Tools and gauges manufactured to simplify machine settings, incorporated resulting in reduced consumption of spares, such as shuttles picking boards and pickers.

Correct procedure established to process correct yarn packages at cone winding.

Instructions given and after a complete overhaul the warping machine was correctly aligned and set for suitable warp processing, yarn breakages decreased and efficiency increased by over 40%.

Re-organised Drawing-in section and established procedure system.

BANGLADESH TEXTILE MILLS

Established Training Department for mechanics and maintenance staff. Selected suitable area, installed training loom, school equipment and organised basic instruction in preventative and corrective maintenance, safety measures and lubrication systems.

The shuttle consumption was very excessive due to procurement of incorrect model. This problem was quickly resolved after giving them advice on checking procedure.

DEAKESWARI NO. 1

General recommendations for loom settings, increasing package values, reducing costs by correct preventative and corrective maintenance thereby increasing working life of spare parts and accessories.

Introduced correct weaving operations procedures for non-automatic looms.

Standardised training procedures.

Warping machinery overhauled and procedure for continuous maintenance introduced.

DEAKESWARI NO. 2

Recommendations for correct work procedures given for loom winding, pirn winding, sizing and elementary maintenance on the loom. Investigations carried out into the feasibility of re-establishing a existing Turbo generators for the emergency power supply.

KUSHIYA TEXTILE

Recommendations given for sizing formulae and systematic recording system. Introduced maintenance procedure for the looms, establishing correct looms speeds, and primary instructions on fabric settings. Shuttle care and attention instructions.

EAGLE STAR TEXTILE

Report prepared to incorporate a weaving unit complete with machinery requirements and weaving production plan, in this factory, at present producing only yarn.

OTHER WORK DONE

Hand Loom Board

Visited several sites for cloth production including Narsingdi and Tangail, and recommended several different formulae for yarn sizing.

B.F.I.D.C.

Arrange meetings to discuss the manufacture of accessories for B.T.M.C. from Timber produced in Bangladesh. Parts were manufactured put on trial which showed encouraging results.

B.C.S.I.R.

Assistance given in setting-up the preparation and weaving research unit.

B.I.T.A.C.

Arranged assistance to B.T.M.C. for the manufacture and supply of spare parts.

Recommendations and specifications given to local manufacturers of reeds and shuttles to improve the quality of the products and meet the demands of the Industry.

CONCLUSIONS

Many changes have occurred in Bangladesh during the last four years one of them is the return of sections of the textile industry to private ownership and with that the reduction of B.T.M.C. enterprises. If B.T.M.C. are to compete with the private industry efforts must be made to re-introduce effective machine maintenance, quality control systems, more effective management, and production incentives.

Balancing Modernisation and Rehabilitation of the industry, government and private, are now being processed, this should raise the quality of products and generate a healthy competitive situation. A large percentage of the weaving fabrics produced have a simple plain construction utilised mainly for dyeing and printing, the quality generally is low and must be improved to be an acceptable competitive article. The specialised weaving units appear to be struggling under a marketing problem, consequently need a market research investigation to enable them to produce new varieties of fabrics and keep abreast with home and international market trends.

APPENDIX - 5

LIST OF COUNTERPARTS

<u>Name</u>	<u>Qualifications</u>	<u>Designation</u>	<u>Service and External Training</u>
Mr. S. B. Das Gupta	Diploma-in-Textile Technology	General Manager/ Senior Counterpart	From 21.12.1979 to 31.12.1980
Mr. A. B. M. Jalaluddin Khan	Bachelor of Arts, Diploma-in-Spinning and Weaving.	Manager/Senior Counterpart	From 14.9.1981 till date.
Mr. S. Chandra Paul	Diploma-in-Textile Technology	Assistant Weaving Master/ Counterpart	Received training on Textile Eng. and Management in Netherlands. From 28.3.1980 to till date.
Mr. A. B. M. Mozammel Haque	Diploma-in-Textile Technology	Assistant Weaving Master/ Counterpart	From 2.5.1980 to till date.

