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PRIVATE TEXTILE MILLS - PRODUCTION MANAGEMENT SYSTEM

DP/BGD/84/051

BANGLADESH

Technical report: Textile dyeing and finishing*

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

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* This document has not been edited.

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I N T R O D U C T I O N

This is the final report covering my assignment with Project DP/BGD/84/051- "Private Textile Industries-Production Management System" as Dyeing and Finishing Adviser from March 1987 to 7th August 1989.

Purpose of the Project:

The development objective to which this project is related as set out in the Project Document was to increase the techno-managerial efficiency in the private sector spinning, weaving and finishing mills so as to increase productivity, improve quality and achieve profitability of the mills. In addition, reduce the country's reliance on imported yarn and fabric, to raise the industry to international competitive standards and eventually penetrate the export market.

The immediate objectives of the project are:

- To identify techno-managerial weaknesses in the operations of the country's private textile mills.
- To formulate, on a mill by mill basis, action programme to overcome these weaknesses.
- To assist mill management in implementing agreed action programmes.

Background:

The textile sector occupies an important place in the economy of Bangladesh. It includes 60 units in the modern sector, about 4,37,000 traditional handloom units in the cottage sector, a recently emerged and growing small-scale powerloom sector with about 15,000 looms installed, and rapid growing garment industry geared to exports. Altogether roughly one million people are employed in textiles with 850,000 in handloom sector, 75,000 in the modern mill sector and about 60,000 in other groups of textile industries. Imports of cotton, yarn and cloth rank third after fuel and food. Domestic textile ranks second to jute manufacturing in contribution to the industrial sector share of GDP.

The modern mill sector plays a critical role in the textile sector, since it supplies the handloom weavers with most of their yarn requirements, and itself produces about 50% of domestically produced cloth. It has an installed spinning capacity of about one million spindles and weaving capacity of about 10,000 automatic looms.

The performance of the mill sector altered markedly over the post-liberation period. Yarn production in FY 70 stood at 105.7 million lbs; by contrast, production was 95.3 million lbs; in FY 82, although there was no appreciable shift in the count mix, and installed spindle capacity had increased roughly 20%. Increased age of machinery explains part of the decline in performance, but there is little doubt that the departure of Pakistani entrepreneurs and managers left a gap which led to a decline in performance.

Poor capacity utilisation has been a major cause of decrease in mills profitability over the period FY 71 - FY 82. Price controls on mill output have also contributed to poor mill profitability. Recently price control policies have been liberalised and this coupled with the elimination of sales tax on raw cotton, has led to a return to profitability in some mills. However, there remains need to address continuing inefficiency or weakness in operational management performance.

IDA has provided two credits to the Government to assist in implementing balancing, modernisation and replacement (EMR) projects in the mill sector. The first (February 1982) credit of US\$ 30 million was to about 15 public sector mills under the direction and control of Bangladesh Textile Mills Corporation (BTMC). The second (July 1984) credit of US\$ 45 million was to finance EMR requirements for about 7 public mills and 15 private mills. Whilst these credits aimed to address the immediate requirements of physical EMR, it remains essential to correct the techno-managerial weaknesses of the sector, without which the improvements secured by physical EMR can be expected to be shortlived.

As a pre-requisite to the first, credit therefore, IDA initiated a Textile Industry Development Programme, which UNDP funded and UNIDO executed (BGD/73/049 and BGD/82/006). Under this programme, the Textile Industry Development Centre (TIDC) at Savar was established, courses in spinning, weaving and finishing

were developed, and counterparts were trained. In addition, 16 selected mills were the recipients of in-plant productivity assistance. This programme ended in early July 1984.

During the second IDA credit, a continuing need for in-plant productivity assistance to the private sector mills has been addressed through the initiation of this technical assistance project in early May 1985. The approved original project was due to commence in July 1985 and was scheduled to be completed in May 1986. However, the project was delayed due to clearance formalities and selection of experts. The Weaving Expert arrived in May 1986 followed by Spinning Expert in December 1986 and the Dyeing and Finishing Expert joined the project in March 1987.

Duties:

As a member of an international team of experts assigned to this project covering spinning, weaving, dyeing and finishing my assignment covers the dyeing/finishing activities. My duties were to visit some selected textile mills in the private sector, identify areas where production practices can be improved and outlining a costed action programme.

My duties were:

- analyse production plans, performance indicators and operation procedures and practices;
- identify constraints on productivity, capacity utilisation and output and propose remedial measures;
- prepare consultancy proposals, discuss them with the mill management concerned;
- participate in implementing the agreed action programme within the limitations of available time and manpower.

After conducting technical surveys of some of the selected textile mills the requirement and importance of training was urgently felt by the mills management. Accordingly, the Technical Assistance Project Proposals(TAPP) of the project was revised in December 1988 in order to make provision for organising training courses at TIDC for mills personnel both in private and public sectors. As a result the expert assignment was extended for further six months for conducting Dyeing/Finishing training courses in accordance with TIDC's schedule.

My present work is presented under three headings covering, the service to industry, training at TIDC and recommendations.

SERVICE TO THE INDUSTRY

Action Plan:

Of the 25 private sector mills under Bangladesh Textile Mills Association (BTMA) only 7 has operating Dyeing/Finishing facilities. However, most of the Dyeing/Finishing units in Bangladesh operate individually and are not members of BTMA. These units are under the control of the Department of Textiles. Under the Department of Textiles about 40 mechanical Dyeing/Finishing units with annual capacity of 45 million meters of grey fabric are in operation.

During the first eight months of the Expert's assignment, survey for 6 mills under BTMA were completed. With the transfer of the project counterpart activities to the Department of Textiles another 10 Dyeing/Finishing units has been allocated for the expert study. These 10 mills represent those which are given facilities to import grey fabrics with the purpose of processing it locally and supply quality finished fabrics to export oriented garment producers.

The work-plan for the expert covered the following aspects in each mill:

- Carry out the needed techno-managerial survey studies, suggesting methods to improve working conditions, productivity, product quality, balancing and modernisation of the existing facilities, etc.
- Prepare a written survey and recommendations report for the mill management.
- Assist in implementation of the recommendations.

In addition to testing, machinery layout, manpower allocation, process methods to correlate information for the survey reports on the spot, instructions and practical demonstrations on production techniques were given, with the objective of increasing productivity and improving finished fabric qualities.

Findings:

- The textile industry in the country is affected to a large extent by foreign textiles which are either smuggled in, or illegally released by export oriented garment manufacturers thus affecting sales of the locally produced fabrics.
- Due to inferior quality, the textile manufacturing sector has not been able to make any sizeable impact on the garment sector. On the other hand and as mentioned, it appears to have a reverse effect. In many cases fabrics imported for the garment exports at favourable terms have seeped into the textile market forcing local textile manufacturers to curtail production.
- Bad quality of yarn produced locally and frequent weaving faults give inferior quality of finished fabrics not acceptable to market especially to the garment industry.
- As regards to the supply of grey fabrics to the private Dyeing/Finishing industry, the handloom sector is playing an important role. About 75% of the domestically available cloth in the country comes from handloom, 15% from BTMC mills, two percent from the relatively small but growing private sector and the rest from imports under a scheme to process imported grey fabrics to cover the needs of garment exporters.
- The majority of the new Dyeing/Finishing units were set up by traders with little technical or management experience. In other cases were not set up as long term ventures, but only to make quick profit.
- Few of the disinvested mills are virtually closed down as they were handed over to their previous owners or these ancestors who were not willing to invest in them and were not able to run them in a reasonably efficient way.
- There is a lack of knowledge of the market and what is required. Mills tend to make similar types of products and other much needed fabrics

are not produced such as good shirting and good lining.

- In most of the mills lack of adequate maintenance and shortage of spare parts is another constraint on the efficiency. A further constraint on efficiency in some mills has been the frequency of power failure. In some mills production loss can be up to 25-30%.
- Many of the mills under-utilise their Dyeing/Finishing capacities to the extent of 50-60%. A vast scope exists for substantial improvements in balancing and modernising processing techniques of production and management aspects.
- Nearly all the Dyeing/Finishing mills visited has no systematic quality control programmes. In 2 or 3 mills there exists poorly equipped laboratories but not utilised.
- There is a problem of shortage of skilled and trained staff at all levels in the industry, particularly at the levels of supervisory and middle management personnel as well as technical personnel responsible for maintenance and repair of machinery.
- Many of the workers and machine operators come from an agricultural background and still have considerable ties with their village communities. Their frequent absenteeism causes disruption of production at certain seasons of the year.
- One of the most important and basic reason for failure of some mills is the lack of professional managerial forces who can take the responsibility of running the mills in a better way.

On the other hand where technicians are employed, there is always changes of technical personnel which affects the stability and progress inside the mills. Not in a few cases we arranged with finishing technicians to change some methods of production but in our following-up visits we found that they have left service. This happend frequently with management levels

inside some mills and affected the continuation, progress of efficiency inside the industry.

- The development of technological education and management training has not kept anywhere near the needs of the industry. The result is that the existing managements take direct control of a number of functions and are frequently overworked as they have difficulty in delegating authority and responsibility to the technologically inexperienced staff.

Results:

During the assignment field visits to the sixteen processing mills were carried out (Appendix I). In many cases defects in the processing methods were indicated and consultancy services given. Examples of such consultancy services are as mentioned (Appendix II).

Separate survey and recommendations report for each and every visited mill has been presented. The survey reports included information regarding machines available in each mill, its production capacity, condition and layout of machinery. The information collected served as a foundation for assessing existing conditions and advising on future development plans.

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

- Problems of trouble-shooting nature.
- Changes in existing processes or methods with a view to affect savings in cost of production, quantity and quality improvement.
- Introduction of new processes and techniques.
- Utilisation of idle machinery, raising machinery productivity and studying future balancing and modernisation plans for some mills.

During the expert service delays occurred due to two devastating floods hitting the country as well as frequent policy changes. Following up the implementation of our recommendations was not an easy job. This was mainly due to delays in procuring some necessary items for improving production; communication difficulties and frequent changes in mill management. However, under such adverse conditions we were able to carry on with 30% of our recommendations which in our opinion is not a rewarding result compared to the efforts exerted.

TRAINING HELD AT TIDC

After conducting surveys of some of the selected mills the importance and need of training was greatly felt by the mill management. The production efficiency of many mills are very low due to the lack of technical and managerial capabilities. This was felt during the expert assignment and as mentioned earlier it was decided at a later stage of the expert's assignment to conduct some Dyeing/Finishing training courses at the Textile Industry Development Centre(TIDC), Savar for the mills personnel both in private and public sectors.

The Textile Industry Development Centre(TIDC) belongs to Bangladesh Textile Mills Corporation and is the only establishment of its kind in the country. It was established during early 1983 under UNIDO Projects BGD/73/049 and BGD/82/006 with the aim of serving the needs for training as well as service and testing mainly of the BTMC mills. It may be mentioned that since that time many of the BTMC mills has been disinvested while more mills have been established in the private sector of which there is about 40 medium and small processing units.

Findings:

- During the last few years very little activity has been taking place in this centre with few courses held occasionally for participants of BTMC mills.
- Most of the conducted training courses are general in nature and do not cover specialised subjects.
- The Centre has not been able to attract participants from the private sector and its impact on this sector both in the field of training and testing is virtually poor.

On the other hand the technical staff inside the mills are not given the chance or necessary encouragement to gain more experience. Some management in the private sector are under the impression that by training their employees will leave them for well-paid jobs.

- One of the main problems facing the management of the Centre is that being situated in an isolated place, about 25 km. from Dhaka city, the lack of telephone communication and transport facility makes it difficult to run its day to day activities. BTMC mills may be contacted through the Head Office but on the other hand experience has shown that it is a very difficult task with mills belonging to private sector.
- The Centre has not been able to properly utilise its existing facilities. The laboratory machines which depends on steam for its operation are not functioning due to delay in gas connection to the boiler.
- Compared with other similar institutions which were established by UNIDO in other countries this centre did not have the conditions to start its activities in a proper way. Due to delays in completion of the buildings of the centre the equipments were installed after departure of the international experts. Moreover, most of the expert's counterparts who had been sent abroad on fellowship left the service of the centre mostly to the private sector.

Activities:

A - Training:

During the Expert's assignment the following training courses were held at TIDC, Savar.

| | <u>Level of Training</u> | <u>Course Duration</u> | <u>Total no. Attended</u> |
|--|---|------------------------|---------------------------|
| 1. Quality Control in Textile Processing | Dyemasters | One-week | 21 |
| 2. Dyeing and Finishing of Textiles | Dyemasters/ Asstt. Dyemasters | Two-weeks | 15 |
| 3. Maintenance of Dyeing/ Finishing Machinery | Foremen and Fitters | Two-weeks | 12 |
| 4. Hand Screen Printing | Instructors of Department of Textiles | One-week | 33 |

- Delivered two series of lectures covering Dyeing/Finishing during a 4-week management training course organised by Bangladesh Project Management Institute(BPMI). The course was basically intended for 25 newly appointed Superintendants of the Monotechnic Institute under Department of Textiles in order to enhance the technical know-how of the new recruits.
- A one-day orientation course was held at TIDC, Savar and was attended by 26 senior officials of BTMC. The Chairman, BTMC was also present on the occasion.

B - Prepared Hand-outs:

Based on our observations and as requested by mill managements, certain techno-managerial topics were selected, written and reproduced. Copies of the same were widely distributed among mills and other relevant institutions.

These may be summarised as follows:

- Management Development - Series I, II and III : included selected articles prepared with the aim of developing the techno-managerial skills of the mills personnel.
- Manual on Quality Control in Textile Processing
- Stain Identification and Removal from Textile Fabrics & Garments
- The Properties of the Different Thickenings used in Textile Printing
- Printing Methods and Hand-Screen Printing techniques
- Printing on Polyester/Cellulosic Blended Fabrics

C - Study Tour:

A 2-week study tour was arranged for Government personnel in order to enable them to study and observe the functioning of similar institutions like TIDC and visit textile mills in neighbouring countries. The study tour was undertaken from 14th June - 27th June 1989 covering India and Sri Lanka. A team consisting of following members was nominated by the Ministry of Textiles:

1. Mr. Anwarul Islam
Joint Secretary
Ministry of Textiles
2. Dr. Aftabuddin Hossain Chowdhury
Principal
TIDC, Savar
3. Mr. Mortuza Karim
Deputy Director
Department of Textiles

The following institutions were visited:

In India:

- a. Indian Institute of Technology(Textile Division), New Delhi
- b. National Textile Corporation of India, New Delhi
- c. Bombay Textile Research Institute, Bombay
- d. Century Textile Mills Ltd., Bombay

In Sri Lanka:

- a. Met the Secretary and Director of Ministry of Textiles
- b. Textile Training and Service Centre, Ratsmalana
- c. Clothing Industry Training Institute, Ratsmalana
- d. Magnum Garments Factory, Mount Lavinia
- e. Kaundanmal Industries Ltd.(Apparels Division), Mount Lavinia
- f. Sigri Textile Mills Ltd., Ratsmalana

From this study tour the team got the opportunity to visit several institutions similar to TIDC in Bangladesh. They have been impressed and informed us that they will recommend in their reports to the Government for certain measures to improve the performance of TIDC in line with those institutions in the visited countries.

RECOMMENDATIONS

A - Recommendations for Industry's Consideration:

- There should be some sort of protection to the local industry, but there is no justification for the industry for always laying the blame on the hard competition suffered from the presence of foreign textiles. The mills should be able to produce finished products with a good degree of excellence to be accepted by the garment producers. With some added care simple fabrics used to an appreciable extent by the garment industry, such as nylon, tafetta, 65/35 polyester/cotton fabrics, popline, grey cloth, etc. can easily be produced.
- It would be in the interest of the textile and garment industries as well as the economy of the country if the industry gears itself to produce varieties of cloth required by the garment industry.

To achieve this better co-ordination between the mill sector and the garment industry in the country is essential. Already some mills are importing quality grey fabrics and dyeing/printing and finishing it for the export garment industry. Beside going this way production of good quality of yarn and woven fabrics should be achieved.

- There is urgent need for balancing and modernising some of the existing processing units and especially in those equipped for processing synthetic and blended fabrics. Modernisation is also necessary for increasing productivity and reducing cost of production.
- The use of semi-continuous and continuous dyed technique (pad-batch and continuous dyeing) should be encouraged so as to cope with long runs of dyeing orders mostly required by the garment industry. For this few machinery additions are needed in some mills but better results can be achieved besides lowering of production costs.
- With to-days high fuel cost and the abundance of comparatively cheap natural gas in some areas of the country, it is recommended that whenever

natural gas is available, gas heated machinery should be preferred and used more frequently in the operation of boilers, drying, setting and stentering machines.

- Enforcing effective quality control and testing programmes within the mills is very much required. Quality control measures should be improved and applied in all mills.
- The scarcity of spare parts in the mills is a common factor. Machines have been kept running without adequate maintenance and spares. In some mills machines are old and the manufacturer no longer supplies spare parts.

It is recommended that proper maintenance of the machinery should be ensured and a schedule for preventive maintenance to be established in each mill. Action should also be taken to break the deadlock to manufacture locally or import the spare parts needed for some key machines in the mills.

- The most urgent requirement of the industry is the training of personnel at every level. The production efficiency of many mills are low due to the lack of technical and management capabilities. The staff in each mill should be given every encouragement to become more acquainted with their work.

In this respect co-operation is needed with specialised training centres like TIDC, BMDC, etc. for achieving this aim. Training of the mills personnel should be looked after as a long term investment in the right direction and should have the full support from all parties concerned.

- There is a great need for adopting modern management techniques for improving productivity. Rise in productivity is influenced by the initiative, drive, and far-sightedness of the management. Managements should also concentrate in depth to improve the quality of production, planning, control and support worker training programmes.
- Managements should give the right encouragement and proper understanding of the employees. There should not be frequent changes of managers and technical staff, as this contributes to deterioration of production.

- Labour should have the proper sense of responsibility. There can be no quarrel with the right of collective bargaining, but it is also true that this should not be used to justify poor performance.

B - Recommendations for Government's Consideration:

- The textile sector should be the prime mover in the economy of Bangladesh by virtue of its significant contribution to the industrial production, large employment, meeting the basic need of clothing and foreign exchange earnings. Sustained and balanced development of the textile sector is vital to the overall economic health of the nation (quote page 1 of textile policy).
- In order to encourage the use of locally manufactured fabrics for the garment sector an appropriate incentive scheme should be worked out to help attaining this goal. There appears to be a strong case that the sale of fabrics to the garment exporters should be treated as exports and various taxes and other incentives such as grants, rebates, etc. are made available to the textile manufacturers on a rational basis. On the other hand protection is needed to help the local textile industry to stand the impact of smuggled foreign textiles or textiles illegally released by export oriented garment industries.
- The growing sickness in the textile mills and power loom sector because of indebtedness, financial difficulties, managerial incompetence, technological obsolescence, poor marketing, mis-investment, labour problems, etc. will have to be addressed boldly and systematically to restore the health of the textile industry as a whole (quote page 13 of textile policy).
- Active consideration to increase foreign investments in joint projects and on mutually beneficial terms should be encouraged. However, while welcoming such joint projects care has to be taken not to introduce obsolete machinery or outdated techniques.
- Government agencies and banks should ensure that loans given to textile mills are properly utilised and the management is efficient. If found

* A comprehensive Textile Policy was announced by the Government of Bangladesh on 13th March 1989.

necessary the Companies Act can be suitably amended to make this easier.

- The increase in the bank lending rate has become so high that the industrial sector including textiles is greatly handicapped, particularly following the manifold increases in the international prices of machinery, spares and raw materials. It is recommended that the banking sector give more help and support to the process of industrialisation and economic growth through easy and cheaper credit facilities.
- The use of obsolete and outdated machinery contributes to the low-level of productivity in some textile units. On the other hand the textile industry can't afford capital, intensive machinery because of scarcity of capital and unemployed manpower. It is recommended that the use of appropriate technology and machinery be popularised and encouraged by providing the needed balancing and modernisation schemes for such units.
- There is a growing shortage of skilled labour and technicians in relation to actual requirements of the textile sector. With the present expansion in this sector, there would be a further worsening of the supply position of technicians and skilled labour.

In order to evaluate and plan for the future on correct lines, a survey of the technicians and skilled labour of the textile industry should be made so that a programme for industrial training could be instituted in the light of technical skill shortages in the country.

- For long term textile industry planning, the Government should envisage to support and patronise the existing Textile College in Dhaka. District Textile Institutes under the Department of Textiles need to be strengthened to fill the existing gap in textile education.

A major role in covering the needs of mills personnel, both from the public as well as the private sector can be played by TIDC. This should keep an efficient and close contact with the industry as indicated in the statement of textile policy announced by the Government (quote page 18 of textile policy).

* A comprehensive Textile Policy was announced by the Government of Bangladesh on 15th March 1989.

" The proposal to bring TIDC directly under the Ministry of Textiles and give it autonomous status so that its facilities are available to both public and private sector will be examined. TIDC should be run by a board of governors consisting of both public and private sector ".

- In the country there exists several scientific, educational and allied institutions. There is a need for greater co-operation and co-ordination among the growing textile industry and such institutions.
- Regularity of power supply to the industrial units should be ensured by the concerned authority to the best of its ability. Though the frequency of power failure has reduced in recent months, it may be advisable to install generating units in mills suffering from frequent irregular electric supply.

C - Recommendations for the Textile Industry Development Centre(TIDC):

- Installing a telephone connection or any other sort of communication is badly needed to enable the Centre's management to perform its daily duties. A quick action is also required to put the steam generator in operation.
- TIDC should benefit the textile industry as a whole both to public and private sector. A quick turnover of trainees is required to ensure large number of specialised personnel are fed back to the industry with a good knowledge of the specialisation for which they are responsible.

At the same time the Centre should offer high technology courses of short duration in the form of seminars etc. to middle management and senior management personnels. These seminars would be of a topical or urgent nature on some modern developments in textile processing.

- It is observed that most of the training courses are general in nature and they are repeated from time to time. To get interest to attend the

* A comprehensive Textile Policy was announced by the Government of Bangladesh on 13th March 1989.

training and to encourage the management of the mills to send their staffs, it is suggested that the training courses should be specialised and not to be more than one-week in duration. If more time is needed the course can be run in 2-3 parts as required with time intervals, say one month in between. Examples of some proposed courses in the field of textile processing can be as mentioned in Appendix III.

- More emphasis has to be given to the practical aspects in training. The chemical laboratory has to be equipped for proper practical training and a mill visit may also be included in each of the practical training courses.
- The Centre has a hostel with accommodation for 60 persons. Lately the boarding facilities has improved but more steps are needed to make the trainee's stay more attractive and enjoyable.

At present it is compulsory for BTMC trainees to stay during the training courses in the hostel. This should be also the case for the other trainees from the private sector as travel to and from the centre on a daily basis besides being time consuming is not practical and causing absenteeism.

- There should not be frequent changes in the training staff of TIDC, but trainers who are not interested in this type of work may be replaced by others who like to work as trainers. This will result in better performance and success of the centre's activities.

In addition, specialised part-time and outside experienced textile technologists may assist in giving selected lectures in each course.

- The Centre should have the ultimate aim of becoming self supporting. Training fees and payments for carrying out tests can be the main source of income but at a later stage when good service is established and confidence attained. To attract trainees other than those of BTMC, BTMA and Specialised Textile Mills Association, the private sector may subsidise expenses of their member mills. The Government departments like Department of Textiles, Handloom Board, Sericulture Board, etc. should

have provision in their budget to finance the training expenses of their employees.

- The Bangladesh Project Management Institute(BPMI) and Bangladesh Institute of Development Studies(BIDS) can cope with requirements as regards to management oriented courses, but TIDC will have to play its part in textile oriented management courses. The BIDS can also supply instruction training courses as required, but again the TIDC can be called upon to provide the textile content.

LIST OF SELECTED MILLS

| <u>Sl.No.</u> | <u>Name of the Mills</u> | <u>Location</u> |
|---------------|--|-----------------|
| 1. | Al-Haj Textile Mills Ltd. | Ishurdi |
| 2. | Muslin Cotton Mills Ltd. | Kaligonj, Dhaka |
| 3. | Mohammadi Calendering Mills Ltd. | Dhaka |
| 4. | Siddique Textile Mills Ltd. | Narayangonj |
| 5. | Fatullah Dyeing & Printing Mills Ltd. | Narayangonj |
| 6. | Quayyum Dyeing & Printing Mills Ltd. | Comilla |
| 7. | Syntex Printing & Finishing Mills Ltd. | Gazipur |
| 8. | Greenways(Bangladesh) Industries Ltd. | Tongi |
| 9. | Hussain Dyeing & Printing Mills Ltd. | Gazipur |
| 10. | Modern Dyeing & Screen Printing Mills | Dhaka |
| 11. | Panther Textile Mills Ltd. | Dhaka |
| 12. | Phoneix Fabrics Ltd. | Dhaka |
| 13. | M. M. Dyeing & Finishing Mills Ltd. | Dhaka |
| 14. | Pahartali Textile & Hosiery Mills Ltd. | Chittagong |
| 15. | Chittagong Textile Mills Ltd. | Chittagong |
| 16. | Specialised Textile Mills Ltd. | Chittagong |

CONSULTANCY WORK

| Name of the Mills | Work Done |
|-------------------------------------|---|
| 1. Al-Haj Textile Mills Ltd. | <ul style="list-style-type: none"> - Revised chemical recipes used in desizing, scouring and bleaching.* - Advised on decreasing dyeing faults due to crease formation during fabric preparation.* - Suggested techniques required for proper operation and utilisation of the existing jigger dyeing machines. |
| 2. Muslin Cotton Mills Ltd. | <ul style="list-style-type: none"> - Prepared a study on the overall operation of the processing department and maintenance needed for proper operation of its machinery. - Decrease of printing costs on cotton fabrics by printing on naphtholated grounds.* |
| 3. Mohammadi Calendering Mills Ltd. | <ul style="list-style-type: none"> - Better results were obtained by the use of sodium hypochlorite instead of calcium hypochlorite in bleaching.* - Precautions for proper operation of the fabric mercerizing machine and methods needed to obtain better mercerization affects while economising in chemicals consumption.* - Techniques needed to avoid occurrence of shade variations on jigger dyeing machines.* - Increase in colour yield by intermediate drying. - Production of high quality easy care dyed cotton fabrics.* |
| 4. Siddique Textile Mills Ltd. | <ul style="list-style-type: none"> - Advised on measures needed to minimise the happening of oil stains on fabrics.* - Carried successful trials to obtain level dyeing on polyester fabrics.* |

CONSULTANCY WORK

| Name of the Mills | Work Done |
|---|---|
| 5. Fatullah Dyeing & Printing Mills Ltd. | <ul style="list-style-type: none"> - On the request of the mill management an expansion study was done to add cotton processing to the existing facilities of dyeing & printing of polyester fabrics. - Pre-scouring of polyester fabrics before dyeing on jet dyeing machines.* - Need to pre-set polyester fabrics to improve the quality of finished product. - Optical brightening of some shades dyed on polyester fabrics. - Obtaining more brilliant disperse colour prints on polyester fabrics by pressurised steam fixation. - Advised on measures needed to obtain accurately printed designs.* - Advised on measures needed for effluent disposal. |
| 6. Quayyum Dyeing & Printing Mills Ltd. | <ul style="list-style-type: none"> - Improved colour deepness of sulphur black dyed fabrics.* - Increased colour yield by intermediate drying. - Economy in cost by dye substitution.* - Confering silky touch to 100% polyester fabrics.* - Advised on measures needed for proper operation of the mercerising machines. - Suggested some attractive printed designs.* |
| 7. Syntex Printing & Finishing Mills Ltd. | <ul style="list-style-type: none"> - Advised on techniques for proper pre-treatment of cotton fabrics.* - Dyeing of vat colours by pad-jig methods. - Pigment dyeing and finishing.* |

CONSULTANCY WORK

| Name of the Mills | Work Done |
|---|---|
| 8. Greenways(Bangladesh) Industries Ltd. | <ul style="list-style-type: none"> - Pre-cleaning of oil stained polyestered fabrics.* - Obtained level dyeing on polyester fabric by use of suitable buffering chemicals.* - Analysis of reasons causing increase in faulty dyeing of polyester fabrics.* - Increase in polyester dyeing production. - Correction and stripping of faulty dyeing. |
| 9. Hussain Dyeing & Printing Mills Ltd. | <ul style="list-style-type: none"> - Brighter colours for polyester dyed fabrics. - Proposed a better layout for creation of newly purchased EBR machinery.* |
| 10.Modern Dyeing & Screen Printing Mills Ltd. | <ul style="list-style-type: none"> - Revised chemical recipes used in desizing, scouring and bleaching of cotton fabrics.* - Precautions for proper operation of the fabric mercerising machine and methods required to obtain better mercerisation affects while economising in chemicals consumption. - Brighter colours for some polyester dyed fabrics. - Increase in dyeing production for polyester fabrics. - Economy in cost by dye substitution. - More utilisation of the capacity of the mangling/drying machine. - After-treatment of reactive colours for better dye fixation. - Pigment dyeing and finishing. |

CONSULTANCY WORK

| Name of the Mills | Work Done |
|---|---|
| 10. Modern Dyeing & Screen Printing Mills Ltd. (Continuation) | <ul style="list-style-type: none"> - Advised on preparation and cleaning of table printing screens.* - Solved the problem of print-screens clogging (in pigment printing) by the use of proper acid liberating agents.* - Production of three-dimensional surface print effects.* - Advised on conditions needed for obtaining optimum results in screen printing.* - Production of causticised crepe effect on unmercerised and mercerised cotton fabrics. - Revised chemical recipe for production of water repellent finish for polyester fabrics. |
| 11. Panther Textile Mills Ltd. | <ul style="list-style-type: none"> - Proposed to the management needed machinery for their proposed EMR programme. - Brighter colours for polyester dyed fabrics. - Production of crepe cotton fabrics. |
| 12. Phoenix Fabrics Ltd. & 13. M. M. Dyeing and Finishing Mills Ltd. | <ul style="list-style-type: none"> - Precleansing of polyester fabrics before dyeing.* - Confering silky touch to polyester fabrics. - Brighter colours for dyed polyester fabrics. - Three dimensional surface print effects. - Printing of polyester/cotton blended fabrics. - Burnt-out prints on polyester/cotton core yarn fabrics. |

CONSULTANCY WORK

| Name of the Mills | Work Done |
|--|--|
| 14.Fahartali Textile & Hos. Mills Ltd. | <ul style="list-style-type: none"> - Advised on measures needed for proper operation of the shearing and singeing machines. - Better prepared fabric for dyeing.* - Increase in colour yield by intermediate drying. - Minimising shade variations by the use of pad-batch dyeing techniques.* |
| 15.Chittagong Textile Mills Ltd. | <ul style="list-style-type: none"> - Advised on proper control during fabric preparation stages. - Suggested repairs and additions needed to their idle mercerising machine. - Prepared specifications of new machinery required for the BMR project of the mills.* - Operation and utilisation of the idle capacity of the yarn mercerising machine. |
| 16.Specialised Textile Mills Ltd. | <ul style="list-style-type: none"> - Revised chemical recipes used in desizing, scouring and bleaching of cotton fabrics.* - Also suggested work procedures to make best use of the chemicals applied during the scouring process. - Precautions for proper operation of the fabric mercerising machine and advised on methods needed to obtain better mercerisation effects. - Advised on manufacture of covers for the existing jigger dyeing machine. This besides giving better dyeing results, economised in heat consumption.* - Maintenance needed for the existing machinery and use of idle shreiner calender machine. |

* Implemented consultancy work.

APPENDIX-III

PROPOSED TRAINING COURSES IN
TEXTILE PROCESSING

- Raw Materials
- Identification of Textile Fibres
- Basic Chemistry for Textiles
- Textile Bleaching
- Colour Index & Recipe Formulation
- Yarn Dyeing
- Cotton Dyeing I
- Cotton Dyeing II
- Synthetic Dyeing I
- Synthetic Dyeing II
- Textile Printing I
- Textile Printing II
- Table Screen Printing
- Textile Finishing
- Quality Control in Textile Processing
- Stain Removal
- Maintenance of the Processing Department*
- Cost Reduction in Textile Processing*
- Promotion of Polyester/Cotton Dyeing & Printing*
- New Trends in Textile Finishing Machinery*
- Storage & Stock Control in a Dyehouse*

Note: Each of the above courses can be repeated and given separately to the following levels:

- Dyemasters and Asstt. Dyemasters
- Shift-in-Charge and Supervisors
- Foreman, Fitters and Operators

* Specialised courses to be given to Dyemasters & Asstt. Dyemasters