Table VI-2-1 MAJOR PROBLEMS & COUNTERMEASURES

- Summary -

Notes: ◎ First priority
○ Second priority △ Just suggestions

Problems from the viewpoint of Development Targets	Motivations for Countermeasures	Countermeasures (Programmes & Policy Measures)
- Quality -	- Quality improvement is needed -	- Programmes to improve quality -
◇Quality standard of textile products is generally low.	◇Necessity to try to cope with the demand for higher quality goods	(Some kind of impact from the market is required to improve the quality in the up-stream sectors. Promotion of upgrading of the downstream through policy measures)
◇Problems arising out of production control, quality control & equipment maintenance. (Due to Mid-level technical staffs' skill)	◇Need to re-train middle management in production & quality control and equipment maintenance	○Technical guidance on production & quality control and equipment maintenance through technology transfer programmes
◇Problems resulting from inspection system based on the industrial standardization system	◇Streamlining of industrial standardization system through cooperation between Public and Private sectors for quality improvement	◎Standardization of inspection technology and evaluation of product quality by factory. Promotion of establishment of "Pakistan Standard and Qual'y Control Authority"
- Structure of Mid-stream -	- Hindering upgrading of downstream -	- Programmes for upgrading material sectors -
◇Outdated production facilities, low productivity and high production costs due to small scale operation	◇Need to modernize facilities and to promote grouping of operation	◎Financing scheme for facility modernization ◎Financing scheme for grouping of operation
- Infrastructure -	- Hindering foreign investment -	- To be met by policy measures -
◇Control by other regulations and discrepancy with deregulation of investment	◇Control by other regulations obstructs foreign investments.	△Review of controls by other regulations and securing consistency among the related laws and regulations
◇Shortage of electricity supply and frequent blackout	◇Negative effects on capacity, process control, quality control, quality and delivery	△Some action should be considered in the 8th Plan (Problem facing not only textile industry, but common.)
◇Shortage of industrial water supply (especially in Karachi)	◇Negative effects on capacity, process and quality control, quality and delivery	○Development of "Processing Industrial Estate"
◇Problems in public peace and the living environment	◇Important issue in promotion of foreign investment, joint-ventures and technical transfer	○Improvement in public peace and living environment

- Constraints to develop Garment industry -	- Obstructing devel't of Garment industry -	- To be met by policy measures -
◇Import restrictions and high tariffs on Garment materials (Fabrics and ancillary goods)	◇Some defects in the present schemes for imports and tax exemptions. Time and cost being spent for procedures acts against upgrading, efficiency and competitiveness	◎Improvement of import environment for garment materials (Improvement of RMR, streamlining of In-bond and Open-bond Manufacturing Schemes→ Liberalization of imports and reduction of tariff rates after 5 years)
◇Import controls and high tariffs on machinery & parts (policy of giving priority to local-made machinery & parts)	◇It's a hindrance for modernization, rationalization and upgrading in the material sectors. The current temporary tax-exempted importation scheme does not solve the problem.	◎Improvement of import environment for textile machinery and parts (Abolition of BMR & EPU, termination of the current temporary free import measure → Lowering of tariff rates)
◇Poor linkages of upper- and mid-stream with down-stream	◇Need to promote the supply of materials to the higher-value added export sector	◎Adoption of incentives to the supporting industries thereby to promote them
◇Excessive export incentives for the upper-stream sector	◇Need to help promote the supply of better quality materials to the down-stream sector	○Policy adjustment such as termination of export income tax deduction programme for the upper-stream sector and amendment of CED collection system
- Functions of supporting organizations -	- Administrative support needed -	- Programmes for human resources development & technical guidance -
◇Technological problems arise out of shortages of mid-level technical staffs and their low skill level. Nevertheless, the structures of the Government organizations in charge of human resources development and technical guidance are for further reinforcement in terms of their hard facilities and staffs.	◇Stronger support from the administration side for training or re-training of the mid-level technical personnels is required.	◎Reinforcement of the structure of TIRDC, Karachi ◎Establishment of a Textile Training Center particularly for the mid-stream sectors: ◎Establishment of a Garment Technical Center with model factory: ○Reinforcement of public vocational education & training institutes

2-1. Countermeasures against Technical Problems

The various problems and hindering factors observed in the textile industries of Pakistan during the field survey are detailed in Part III of this report. It is assumed that the problems facing Pakistan's textile industry as a whole cannot be simply summarized since there are differences in the equipment and technical levels of individual corporations. In line with the objective of the report, the following is a summary of the main technical problems affecting the textile industry of Pakistan generally when regarded as an export industry, together with a summary of the countermeasures proposed to meet these problems. **Most of the countermeasures require the direct efforts of the firms concerned to carry out improvements, but benefits are anticipated to arise from instruction provided by foreign experts hosted for a certain period. Further, assistance activities undertaken by public supporting organizations and industrial bodies are considered an effective way of solving problems** and these actions are outlined in the present chapter under section " 2-3 Promotion Programmes".

In the consequent paragraphs, every statement "quality control system is not fully carried out" implies that the [Reference VI-01] attached to the end of this paragraph should be referred, where key concepts of quality control and an example of its practical application are presented.

2-1-1. Raw Cotton

The problems relating to the quality of raw cotton represent important obstacles to the development of the textile industry in Pakistan (for details refer to Part III, Chapters 1 and 2). **Even if various improvements of the textile processing industries are undertaken, it will be difficult to effect an upgrading of the evaluation of Pakistan's textile products (yarn, grey cloth, dyed fabrics and garments) if the quality of raw cotton remains as it is now.** In response to this problem, PCSI of Pakistan with the cooperation of the United Nations is already engaged in the standardization of the grading of cotton, and the training of classers. It has been proposed to establish price ranking on the basis of the diffusion of classing technology and grading practises. It must therefore be stressed here that this area is of vital importance to the textile industry and that the textile processing and related industries should vigorously support the proposed activities of PCSI and coordinate their efforts with its programmes. The following countermeasures has been drawn up bearing PCSI proposals in mind.

Problems (hindering factors)	Countermeasures (recommended proposals)
1. Quality problems with raw cotton - high impurities content - unripe cotton content - large number of damaged fibres - differences in dyeing fastness within the same lots	1. Improve method of picking cotton - reinforcement of training given to pickers - improvements in the payment system to pickers (give emphasis to yield by grade instead of by weight) - prohibit picking too early in the morning

	Carry out improvements in the methods of transport and ginning - modify the transport of seed cotton and change the packing materials for lint cotton (change-over from jute to cotton cloth). - strictly control to forbid the mixing of different varieties or grades of seed cottons - improve the ginning equipment with advanced systems Diffuse systems for standardizing and grading cotton - establish quality evaluations and grading of seed cotton and lint cotton and implement price ranking according to grades - promote the training and utilizing of classers
2. The demand among textile processing firms for improvement in the quality of raw cotton is weak	2. Strengthen feedback of requests for product quality from the textile processing firms to the raw cotton suppliers MOI and the Ministry of Food, Agriculture and Cooperatives are to initiate an endeavour, collaborated by the textile processing sector, to enhance the seed cotton supply for eliminating factors hindering upgrading of the seed cotton quality.

2-1-2. Spinning Sector

Problems (hindering factors)	Countermeasures (recommended proposals)
1. The defective product quality of produced yarn	1. Rectification of problems of the quality of raw cotton Upgrading of production technology and especially maintenance technology Selection of machine speeds proper to the current facilities, machinery and technical levels (product quality and production output are impaired by excessively high machine speeds)

2. Insufficient maintenance and maintenance work management of equipment	2. Improve awareness of importance of equipment maintenance Install maintenance equipment and use this effectively Implement preventative maintenance *1), spindle-wise management *2) and inventory control of spare parts and consumables *3) Upgrade the equipment maintenance technology (train and reinforce maintenance staff)
3. Maintenance of cards is not carried out	3. Improve the precision of card grinders and replace deteriorated grinders Choose appropriate wheelstones Upgrade the technology for grinding and gauge setting

*1) preventive maintenance

maintenance activity to prevent failures of equipment prior to their occurrence by means of readjusting, replacing parts, etc. of the equipment on a schedule established on the basis of failure record of the equipment.

*2) spindle-wise management

Removing defects of the specific spindle or machine, based on the analysis of operation records and inspection data for individual spindle or unit machine.

*3) inventory control of spare parts and consumables

keeping the inventory of these materials, especially performing statistical analysis of their consumption records, fixing a system including reordering level and replenishing the materials under the system.

(an example of managing technology for card maintenance is shown in the Reference VI-02)

4. Control of draft rollers is not carried out

4. Improve precision of roller grinders, replace deteriorated grinders
Improve inspection method of grinder shaft centering
Determine appropriate schedule for greasing of bearings
Check the overheated bearings
Improve technology for roller surface treatment and replace deteriorated equipment

5. Critical problems in each process stage are left unattended to

5. Improve managerial awareness of managers
Undertake to discover and tackle problems in production process prior to occurrence of failures

Countermeasures for major failures in each process:

(1) Mixing and blowing process
Make precise gauge setting for each part of equipment

(2) Carding process
Upgrade maintenance technology of carding machine

(3) Drawing and roving process
Upgrade control and adjustment technology of top rollers

(4) Spinning process
Upgrade control and adjustment technology of top rollers

Apply ring and traveller proper to products and production coditions

	Maintain proper positions of spindles and tapes
	(5) Winding process Adjust stop motion devices properly
	Replace guides abraded or damaged
6. Quality control system is not fully implemented	6. Increase importance given to quality control among managers and factory executives Improve the level of basic quality control technology

2-1-3. Weaving Sector

(A) The Mill Sector (Group A)

Problems (hindering factors)	Countermeasures (recommended proposals)
1. Equipment is getting out of date	1. Promote investments to modernize equipment (particularly to encourage the changeover to shuttleless looms)
2. Defects in the quality of the weaver's beam	2. Upgrade the technology of preparatory process - implement maintenance of warpers and sizers - improve sizing technology
	Change the softening lubricating oil (oil agent)
3. Defective quality of produced fabric	3. Upgrade the preparing and adjusting technology for looms Improve the quality of accessory fittings and parts Carry out appropriate inspections of produced fabric Undertake mending based on the inspection results (implement quality control)
4. Shortage of weaving engineers	4. Nurture mid-ranking technicians and engineers through training and instruction

5. Quality control system is not fully carried out	5. Improve awareness and concern for quality control Implement training in quality control

(B) Non-mill Sector (Group B)

Problems (hindering factors)	Countermeasures (recommended proposals)
1. Foundations of industrial management are weak	1. Promote greater concentration or cooperative management between firms
2. Equipment is getting out of date	2. Promote investment to modernize equipment (particularly for a changeover to shuttleless looms) Undertake the renovation of equipment (attaching of stop motion devices for yarn breakage)
3. Defects in the quality of the weaver's beam	3. Improvement and replacement of equipment in the preparing shops - replace the warping creels (replace with H models) - attach automatic stop devices for end breakages Provide instruction in warping and sizing technology to warping firms Improve the quality of the softening agent (oil) Improve the packing and transport methods for grey yarn and beam
4. Defective quality of produced fabric	4. Implement maintenance of looms Employ accessory parts of good quality Implement appropriate inspections of manufactured fabric and establish a system of production management based on the inspection results Set up common inspection centres
5. Technical levels are low	5. Reinforce the technical guidance to mills and firms by means of establishing instructional and training institutes.

2-1-4. Knitwear Sector

Problems (hindering factors)	Countermeasures (recommended proposals)
(1) Knitting process	
1. Defective quality of raw yarn	1. Improve the packing methods for the cheese - use packing cases for carriage to prevent damage to yarn and paper tube - set up and diffuse standards of grey yarn to be used for knitting
2. Limited types of raw yarn available	2. Request the spinning sector a supply of high grade yarn : - fine count yarn (above 30^S) - double twisted yarn ($40^S/2$, $60^S/2$), etc. Use of yarn-dyed fabric and installation of yarn-dyeing equipment
3. No quality control for knitted fabric	3. Perform appropriate inspection of knitted fabrics and take corrective actions in the knitting process upon the inspection results.
4. Shortage of knitting engineers	4. Reinforce the training facilities and train up knitting engineers
(2) Dyeing Processing	
1. Low quality of the finished product - considerable shrinkage rate at washing - insufficient chroma - no luster usually typical of cotton	1. Change dyeing machinery and dyeing methods (dyeing at conditions of low tension) - jet dyeing machine rather than wince dyeing machine - changeover of the drying method (to correct the stretch deformation occurring in the dyeing) - either tumbler (batch system) or net conveyor dryer is commended - a heat setter is needed for mixed cotton polyester blended fabrics Employ spinning mercerization Either soften the water for dyeing use or use deionizer

2. Dyeing stains and uneven dyeing	2.Improve the basic technology for dyeing (knowledge of the various dyeing-finishing methods) Improve production technology (including the control of the conditions of production such as temperature, concentration, flow rate, pressure, etc.) Upgrade servicing and maintenance technology for the dyeing-finishing equipment
3. Shortage of dyeing engineers	3. Strengthen training facilities and train up dyeing engineers (basic training could be carried out in common with courses for dyeing technology for woven fabrics)
4. Quality control system is fully not implemented	4. Implement inspections of dyed fabrics and take actions to improve processing on the basis of inspection results.

(3) Sewing Process

The same problems and countermeasures as seen in 2-1-6 Garment Sector.

2-1-5. Dyeing Sector

Problems (hindering factors)	Countermeasures (recommended proposals)
1. The dyeing-finishing equipment (in particular the cloth piece dyeing equipment) is out of date and deteriorated	1. Carry out a reexamination of dyeing facilities and promote investment aimed at modernization of automation of the important parts of the processing equipment (temperature control, processing time, chemical inputs, etc.)
2. Product quality levels are low - uneven dyeing and disparities in dyeing between lots frequently occur - colours have no lustre	2. Upgrade the scouring technology Render the control of dyes and chemicals more appropriate - employ qualified dyes and chemicals - improve the colour adjusting technology

	Implement systems for preliminary inspection of materials (fabrics) Improve the water used for processing (installation of pre-processing equipment) Employ the mercerization Improve and reinforce inspection methods for finished product - implement a constant dimensional control (length, width) - implement a grading system for output on a defect point system Implement tests of product quality (to test shrinkage, fastness, etc.)
3. Equipment management is insufficient	3. Upgrade maintenance technology for machinery and facilities and systematize it. Implement regular interval cleaning of equipment
4. Need for upgrading of technical and managerial levels of dyeing engineers	4. Retrain mid-ranking engineers and executives Give emphasis to acquisition of technical expertise in the job Set up training systems for recruited engineers
5. Quality control system is not fully implemented	5. Improve awareness regarding quality control Implement training in quality control
6. Working environment is poor	6. Improve awareness of importance of tidiness and order in the workplace Improve the handling of raw materials, in-process goods, and finished products Improve the facility layout (relocate existing equipment when investment for modernization is implemented)

2-1-6. Garment Sector

Problems (hindering factors)	Countermeasures (recommended proposals)
1. Mass production technology is not established	1. Standardize operations and manufacture product of even quality Carry out appropriate process design and equipment layout on the basis of process analysis, ordering of process steps, and measurements of standard times for each product line Improve and standardize processing on the basis of analysis of operations Implement training of operators to increase their understanding and interest in the finished product
2. Product quality levels are low	2. Upgrade the basic production technology of patterning, cutting, sewing and finishing Use materials of a high quality Increase the variety of materials - woven cloths of fine count, piece dyed cloths, etc. - brightly coloured materials Use accessory items (buttons, linings,etc.) of good quality Encourage and increase exchanges and contacts with overseas bodies concerning design and technology
3. Maintenance of equipment is insufficient	3. Implement daily inspection of equipment and servicing operations Sewing machines: - check against loose belts, defects along yarn guide, adjustment of bobbin cases, removal of waste yarn from the shuttle feed dog - removal of trash from the oil tank and oil level check - cleaning of the sewing machine upper body and table

	Cutters: - grinding of cutting edge - checks for loose screws, cutting edge rotation, damage to cutting table and oil stains. Steam irons: - check for nozzle clogging - appropriate temperature maintenance and control - checks for soiling of the iron boards
4. Shortage of personnel who well trained in technology or management	4. Train engineers who can plan process design and production planning Train engineers for designing patterns, grading and marking Train skilled foremen who can provide technical guidance to the sewing operators, and strengthen in-house training systems < Example of in-house training > Adjusting technology of the upper and lower threads of sewing machine, and of thread line of interlock sewing machine.

[Reference VI-01]

A. Quality Control (General)

1. Problem Consciousness

For there to be any improvements made in the existing state of affairs such as upgrading of product quality or operating rates, it is first necessary that there should be consciousness of the deficiencies or problems of the status quo. Obviously, if it is judged that the status quo is satisfactory then problem points will pass unidentified. In actual fact however excellent a factory is, there are always some deficiencies or problems, and new problems arise daily.

Generally speaking, this consciousness over the product quality can arise on functioning of a principle: the product price and the manufacturer's profit vary with actual product quality evaluations which comprise users' and consumers' demands and appreciation and appraisal made by markets.

If pricing showed little difference irrespective of product quality, sales remained constant, and no influence was felt due to the increase or decrease of clients then there would be no need for the upgrading of product quality. Leaving aside the domestic situation in Pakistan, such a state of affairs obviously does not hold on international markets. Therefore, in order to overcome international competition and assure an increased value added through upgrading of output, it is essential to undertake product quality control.

2. Product Quality

In its narrow sense the term "product quality" refers to the quality of finished products, but in its wider acceptance the term encompasses all aspects of the factory or workplace such as the quality, capacity, efficiency of equipment and machinery, temperature and humidity control, operator attendance rates, etc. All of the above are susceptible to Statistical Quality Control (SQC) and so form aspects concerned by quality control.

2-1. Dispersion of quality

When discussing the quality the two concepts of production quality (quality of each step of production activity) and design quality (a designed quality level designated by the management) are employed.

The first step in SQC is to reduce dispersion in the product quality so as to assure a stable situation of production in line with the upgrading of the production quality. Subsequently the improvement of design quality is the next objective, that is the increase or decrease of average of particular characteristic value of the product. This average value and the degree of dispersion is a comprehensive gauge of the technical and control capacity of a given factory. The smaller the dispersion the greater the capability of the factory in technology and control.

For instance,
In the case of machinery operating efficiency; the higher the result the better.

In the case of defective product; the lower the result the better.

In cases where a certain factor is low one day and then high the next, this indicates a lack of stability in processing and reveals that there is some cause for the dispersion in the processing itself.

2-2. Standardization

In order to reduce dispersion in production the following conditions and measures must be maintained:

(1) in production lines such as spinning where a number of similar machines are installed, it is necessary to ensure that the machines are all to the same uniform settings (for revolution, fitting dimensions, timing conditions, etc.);
(2) the quality of raw materials supplied are as uniform as possible;
(3) operating methods, actual operations and procedures are consistent; and
(4) surrounding conditions such as humidity or temperature are kept uniform.

Standardization is therefore the establishment of uniform criteria based on which operations are effected. Although this sounds quite simple, it is not easy to put into practise.

Generally speaking, standardization is achieved taking account of the three factors of stability, product quality and operating efficiency. However, as soon as superior conditions or methods are discovered during implementation, then adjustments will need to be made to incorporate these. The standardized conditions and methods for production need to be codified and procedures for an amendment need to be decided upon.

Standardization is a precondition for quality control, and at the very least needs to be carried out concurrently with the latter. It will be impossible to reduce the dispersion in production quality without standardization.

2-3. Decision of Control Items and Control Points

Problems and troubles are to be handled in order of their gravity and the most pressing to be tackled first.

2-4. Giving Numerical Form to Concerned Data

It is necessary to prepare data for items concerned by quality control in a numerical form. There are two forms:

continuous values : data of measurements of temperature, humidity, strength, length, etc.

discrete values: data in numerical form such as defect rate, failure rate, defects per unit (yarn breakage, etc.)

2-5. Stratification and Data Sampling

It will be necessary to decide how to sample proper data when some specific control item requires investigation. For example, in order to obtain data which indicate differences between machines and differences in morning and afternoon conditions, measurements by machines and by time are required. The preparation of such data is called stratification.

2-6. Graph Presentations

Presentation of data in a graph form is an aid to clear and rapid understanding of difference among the data. It will be necessary to select the most appropriate form of graph for a specific kind of data, so that histograms, cumulative frequency diagrams, segment line graphs, pie charts, scatter diagrams, etc. will be used as appropriate.

2-7. Control Charts, etc.

The drawing up of control charts using the SQC method is a basic step of quality control.

In analysing problems and troubles, statistical methods are useful, depending on the problem. Those are data analysis such as determining the average value or variance differences and correlation analysis for investigating mutual relations between two factors such as humidity and yarn breakage, for example.

2-8. Data Feedback

In order to reduce defects, causes of the defects must be identified using data and then these must be reported back to former processing stages so that the necessary action to remove the root causes can be taken. After action has been taken, it is obviously necessary to confirm whether the problem has been solved or not.

Quality control consists of the constant repetition of the "plan, do, see" activities outlined above, and the statistical approach and methods of SQC are to be applied to the fluctuating variance of production quality. Carrying out inspections will provide data in the form of measurements which give a numerical form to the aspects of product quality under examination, but it must be remembered that this collection of data forms only a part of "do" portion of the overall work to be done.

<u>Reference works available in English</u>

(1) Introduction to Quality Control
by Kaoru Ishikawa, Union of Japanese Scientists and Engineers, Japan

(2) Guide to Quality Control and Company Standardiation
Japanese Standards Association, Japan

B. An Example of Quality Control in Practise (Weaving)

In principle with fabric inspection, the 100% inspection is to be performed (though a sampling inspection is also used occasionally in special circumstances). In order to achieve an improvement in product quality, it is first of all necessary to ensure that the inspections are appropriate and have been correctly carried out. The concrete details of the methods for inspecting fabric are omitted here (these are outlined for example in the TIRDC textbook).

The following explanation focuses on the example of heavy and light filling bars which are frequently encountered problem impairing product quality.

1. Identifying the Root Cause

The separate sheet indicates the typical reasons for the occurrence of heavy and light filling bars of fabric on the shuttle. Diagrams which show the various causes of a given result are known as characteristic diagrams, and individual factories should draw up such diagrams. Such diagrams will differ slightly from factory to factory according to the type and model of machinery employed, but such diagrams should be made as detailed and concrete as possible with all concerned pooling their opinions when drawing these up.

2. Survey of Defective Products and Problem Machinery

The existence of problems should be verified by examining data of cloth inspection and visual inspection of finished fabric. Where it is supposed that a problem exists the machinery should be investigated.

The higher the rank of a manager the more he will tend to rely solely on tables and data in his judgments but it is extremely important to undertake his direct visual inspection of the actual defective product or machine.

Once the defective factor has been identified, repair work must be made and the results confirmed. Data accumulation must be continuously practised and records of actual cases increased so that the situation of machinery (including of machine inspection records) is readily available on record.

3. Implementation of Systematic Maintenance of All Textile Machinery

The systematic maintenance of all machinery is to be carried out on the basis of the data gathered concerning the condition of each individual unit of machinery.

(1) Replacement of worn parts, and remodelling of parts if required

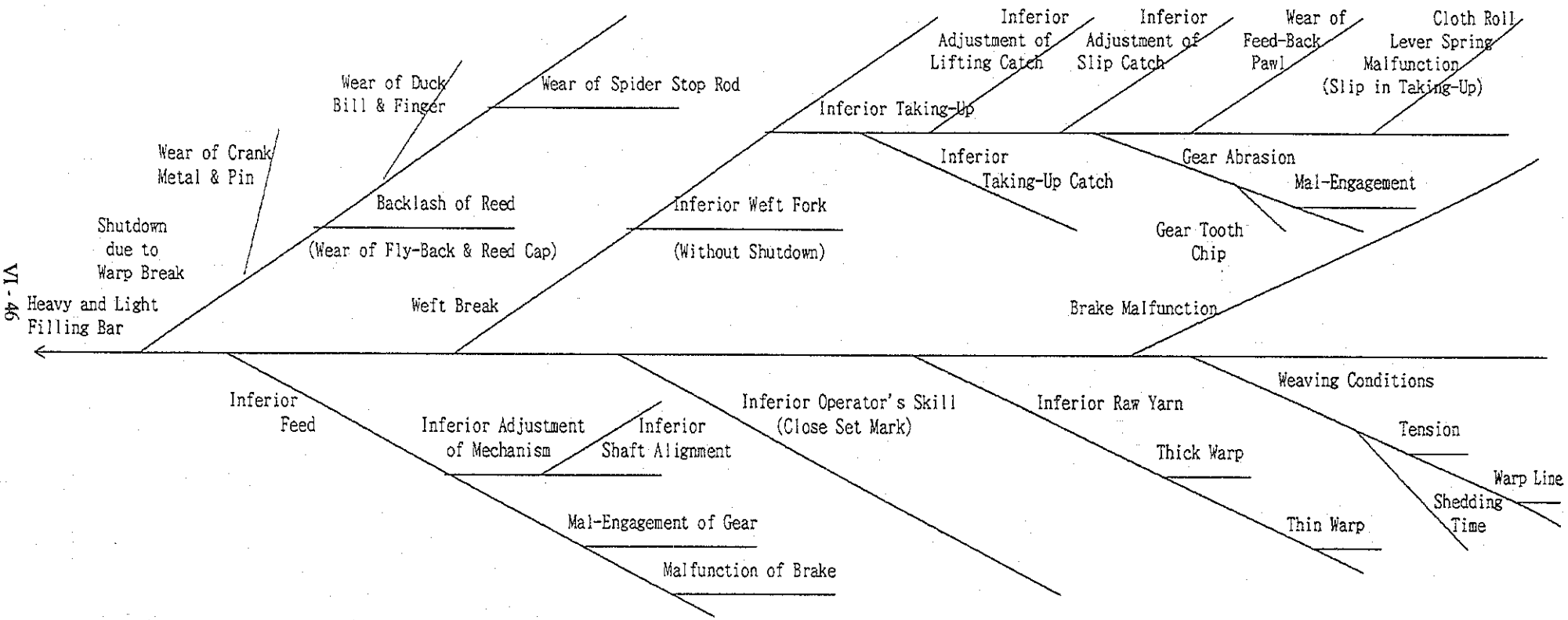
(2) Rectification of incorrectly adjusted parts, improvement of operating methods, operator training, etc.

4. Verification of Results and Preventive Maintenance

Maintenance results are to be verified. If any performance storage or deficiency is found in these results then other reasons for this is to be followed up.

If abrasion or wear of parts is found to be the cause of defects then a schedule for regular inspections and parts replacement is to be established. Quality control also involves the prevention of troubles before these occur through the application of Preventative Maintenance.

CHARACTERISTIC DIAGRAM (HEAVY AND LIGHT FILLING BARS IN A SHUTTLE LOOM)



[Reference VI-02]

Maintenance Control Points of Carding Machine

1. Control Points of Production Process

1) Short fibre contents of sliver
2) Quality and quantity of waste cotton yarn
3) Degree of parallelization of sliver
4) Unevenness of web
5) Nep and trash
6) Quality and quantity of flat strip
7) Productivity
8) Fly waste
9) Unevenness of sliver

2. Routine Inspection Points

1) Carding Machine wire height and wire sharpness
2) Cylinder, doffer and taker-in roller wire sharpness
3) Maintenance of grinder
4) Accuracy of gauge setting
5) Web quality
6) Quality and quantity of flat strip
7) Quality and quantity of waste cotton yarn
8) Defect of sliver
9) Cleaning, wire polishing schedule, weight of sliver, etc.

2-2. Policies Recommended

(1) Intensified allocation of resources to mid and downstream sectors

As aforementioned, **it is presumed that the fiscal policy has largely been responsible for the relatively more rapid progress of the spinning sector.** If one of the major reasons why the development of the spinning sector outstripped that of the weaving and processing sectors could be traced back in the fiscal policy, the management of fiscal measures in the textile industry policy should be critical.

From this point of view, the policy maker should analyze and assess the impact of the fiscal measures adopted in the past upon each subsector in the textile industry and find proper direction in policy formulation so that the target subsector should become economically attractive enough for the investors. **Consequently, the future policy for the development of the textile industry has to be the one that will intensify allocation of the resources to the midstream (weaving and processing) and downstream (garment) sectors.**

(2) Improvement in import environment for raw materials

Most fabrics and some garment parts are currently classified as import-negative items. Imports of these goods should be liberalized at five years' notice. Furthermore, customs duty levied on these goods are also very high (80%-90%), and the possibility of reducing them should be studied. Such measures are believed necessary since domestic fabric and garment parts manufacturers do not have supply capacities sufficient to fully cover makers' needs, particularly in respect of high-quality goods. They would also mean greater scope for garment makers in the choice of materials, a matter of particular importance to an industry. Because the garment industry requires the production system in which it produces wide variety of products, though each production amount per product is small. At present, fabric and raw materials are imported and used in the production of garments for export through a range of bonded-import schemes.

Many Pakistani garment manufactures seldom sell to the domestic market as the domestic demand is very small. Domestically produced fabrics vary from imports in terms of both type and quality, and the two do not compete. Consequently, the influence of imports on the domestic industry seems to be minimal. Domestic production of garment parts is also so small that it would be affected little by imports.

It is recommended that the following measures be taken in the transition period leading up to liberalization of fabrics and garment parts. Firstly, the volume of imports permitted under the Raw Materials Replenishment System (RMR) should be increased. Currently, makers wishing to replenish their raw-material supplies under RMR must limit the volume of raw materials they import to below a fixed percentage of the FOB export value of the goods in which the materials will be used. The removal of this restriction is needed. **Moreover, when makers require replenishment of their raw material supplies under the system, they are obliged to obtain an import licence within 6 months of their last export. It is believed necessary to study the possibility of amending the rules which currently govern the system, to make it possible to submit applications at any time.** This would

enable makers always to have the necessary raw-material supplies for the next scheduled production lot on hand, eliminating the time lag between obtaining the new goods and the completion of previous production lot.

It is also desirable that the bonded-imports system for raw materials be simplified. For example, it would make a more practical import system, if the open bonded manufacturing rules and the bonded warehousing systems were integrated into a single scheme. The Pakistani government is apparently studying such a measure at present, and we would recommend its earliest possible implementation.

It can be suggested that under the new integrated scheme, (1) an open bond system accessible to outside vendors be introduced, (2) domestic sale be permitted so long as import duties and other taxes are paid, and the value of sales do not exceed a fixed percentage of the total value of production (3) sales tax, import surcharges, and Iqra surcharges be exempted as well as customs duty, (4) upper limits on the volume of imported raw materials to be used per product be abolished, (5) limitations on permissible volumes of imported raw materials be eliminated, (6) raw material imports be permitted not only by production unit, but also by commercial importers.

(3) Liberalization of garment imports

It is recommended that imports of garments, currently classified as import-negative items be liberalized as soon as possible and that the import duty, which is currently as high as 90%, be reduced stage-by-stage after the liberalization is implemented. Although national dressing habits cannot be expected to change overnight, allowing imports of garments would be helpful in the formation of a domestic garment market in the long run. In addition to creating domestic demand, the formation of a domestic garment market would generate the additional merit for the industry of providing feedback from domestic consumers in matters of tastes, quality and design.

(4) Import system for machinery and parts

Reductions in import duties on machinery and their parts are believed necessary. With the exception of spinning machinery, imports of textile machinery which is not manufactured locally are currently exempted from customs duty in actuality under SRO-597. Thus reducing import duties and other taxes levied on machinery imports would produce no ill effects. **If the import duties are lowered, the continued existence of the bonded machinery-import system (SRO-962 (1) 90) becomes meaningless, and it could be abolished.** At present the same machinery as the one which is manufactured locally is treated as exceptions and the customs duty are levied on them at the time of import. However, such exceptional treatment of locally manufactured machinery is not necessary: From the points of view of resource distribution and economic efficiency, greater efforts should be made at this stage to the promotion of the exports of textile product rather than the development of textile machinery industry.

Commercial importers are currently prohibited from importing more than 20 million rupees' worth of machin-

ery per year. In the interests of achieving the merits of mass imports as well as the development of trading firms, this system should be abolished. Small-volume imports of machinery increase the unit price of machinery placing buyers at a disadvantage. Users are also disadvantaged from the viewpoint of after sales service by such restrictions. Although the system was intended to curb imports, in reality commercial importers purchase in excess of the fixed import ceiling by paying commissions to other firms for the use of their names in import. Therefore, this restriction is not serving to the intended purpose either. In order for industrial consumers to import machinery on their own it is necessary that they establish special units responsible for conducting the international trade business. The costs involved in this will be substantial, and particularly burdensome to small businesses in the powerloom and garment sectors.

(5) Tax exemption on export income

The government currently grants tax exemption of 25% of the export income to the exporter of cotton yarn. Since cotton yarn has already achieved international competitiveness, it is recommended that such incentives should be discontinued. As well as indirectly hindering the domestic supply of materials to high added value sectors, this tax exemption are against the government's policy to increase the exports with high added value. Abolishing the tax incentives for cotton yarn exporters would promote the supply of cotton yarn to high added value sectors.

(6) Central Excise Duty (CED)

Spinning mills are obliged to pay CED in respect of cotton yarn before the shipment to domestic market, specifically before products leave the premises of their own factories. Export duty, on the other hand, is payable after shipments are made. **The fact that taxes on exports are due later than those on products for the domestic market places the former in an advantageous position in terms of interest payment.** Eliminating this discrepancy would be effective in promoting the supply of raw materials (cotton yarn) to the domestic garment industry.

(7) Adoption of Incentives for Supporting Industries

Supporting industries consist of those firms engaged in dyeing and finishing, processing, and material and parts supply for sectors -- such as the garment industry -- producing high-added-value products for export. **Thus the supporting industries contribute indirectly to exports. However, development of this sector has lagged behind in Pakistan, and this is thwarting moves to boost added value throughout the textile industry. Development of *supporting industries is therefore an urgent topic.*** The government should provide incentives such as a refund of duties paid on imported raw materials and exemption from the domestic sales tax. Although companies in these industries became eligible for the export financing programme starting in February 1991, there remains a shortage of effective incentives.

(8) Investment environment

(8-1) The procedures and its administration

Investors must ensure that all federal, provincial and municipal regulations are cleared before starting up a new business. In order to make the various application procedures both smooth and swift it is necessary that checks are made to isolate problems and to confirm that past complaints lodged by investors have been rectified. **Problems should be investigated by the relevant authorities and people knowledgeable in the particular areas. Any procedures lacking a rational base should be altered.** Responsibility for these investigations should be given to IPB, and it is desirable that constructive advice of IPB be given even in cases where it encroaches upon the jurisdiction of another authority or regional government.

It is also important to ensure that all bodies charged with implementing government policy measures and regulations are notified of changes and faithfully carry them into effect. Continuing to apply regulations when they have been abolished, for example, would weaken investor confidence, and damage Pakistan's credibility as an investment site.

(8-2) Information supply

There is a need to confer one of the relevant government organizations on the function of gathering rules and regulations relating to investment and trade and making it available to investors. It would be essential for the designated agency to handle information on both trade and industry as the two are inextricably linked, particularly in their relevance to investors. Information released by the government on imports, exports and investment, as well as information and data collected by commercial attaches should also be made available for perusal. If the Ministry of Industries' IPB is currently responsible for such a function, then it would be necessary for them to strengthen the function as soon as possible.

A new comprehensive investment handbook should be compiled containing all the laws and regulations which are relevant to investment at federal, provincial and municipal levels as well as, financial and tax systems and any relevant procedures. The information in the handbook currently available is insufficient. **Explanations should be made easy for foreigners to understand, and any of the issues liable to face investors in the operation of factories should be included.** Information should be practical and updated as changes are made to the various rules and regulation.

(8-3) Investment promotion by commercial counsellors

Establishing investment promotion corners in embassies overseas and gathering relevant information for the perusal of potential foreign investors would also be effective in encouraging investment. Occasionally inviting experts from Pakistan or representatives of firms investing there to speak at seminars, too, would prove effective.

(8-4) Establishment of dollar shops

Establishing privately-operated dollar shops under the control of the Government would be helpful in the improvement of the investment environment. The shop should contain imported processed foods and daily necessities, and be available not only to diplomats but for all foreigners with access to dollars. Having a dollar shop would improve the living environment for the families of staff posted there. The Ministry of Finance is said to be studying the possibility of establishing a dollar shop at present. It is desirable that these plans to be realized as early as possible.

(9) Finance system

It is necessary to investigate the problems with the current system of institutional financing, under which low-interest long-term financing for capital investment is provided. In view of the aim of increasing the added value of the textile industry, **it seems particularly necessary to provide low-interest financing for investment in plant and equipment particularly for dyeing and the powerloom sector.**

In addition, many of small-, medium- and cottage-size business, lacking adequate solvency, would benefit from the existence of credit guarantee system offered by such organizations as the Credit Guaranty Association and the Credit Insurance Corporation. The possibility of introducing such system should be studied. It would also be beneficial to invite experts from countries where such systems exist for the purpose of promoting the transfer of the necessary know-how accumulated there.

(10) Textile policy planning unit

It is recommended that a vertical textile policy planning unit to be established within the Ministry of Industries in Islamabad. The duties of the unit would include the gathering of information on imports and exports, investment, finance, taxation and industrial locations, conducting surveys, planning for industrial promotion and formulate policies. It may also act as secretariats for advisory councils to the government and facilitate coordination among the various textile industry groups and related government ministries. The bringing together of up-to-date and relevant information through the establishment of such a unit would lead to more stream-lined and efficient administration and formulation of policy.

It would be important for such a policy unit to be located in the head office of the Ministry of Industries in Islamabad. It would also be necessary to establish branch offices in important regions within Pakistan as part of an information feedback network.

(11) Reorganization and strengthening of links between organizations involved with standardization and quality control

The plan to integrate the PSI and CTL and form a Pakistan Standards & Quality Control Authority (PSQCA) should be implemented as soon as possible. The main activities of PSQCA will include: [1] standards formation; [2] training; [3] testing; [4] information services; and [5] metrology. Judging from the proposed activities of the PSQCA, the strengthening of cooperation with TIRDC would be both possible and effective from the standpoint of establishing and promoting nationwide the standardization of product specifications and inspection criteria in the textile field.

(12) Promotion of raw cotton grading and establishment of a graded price structure

It is necessary that the grading of raw cotton by PCSI and a system of pricing based on these grades be promoted nationwide. Although at the present time classers are being trained and are being placed in jobs in ginning plants all around the country, the placement rate is just 7% (70/1000). The quality of raw cotton has a significant impact on the quality of cotton products made at each stage from the upstream sector through to the downstream sector. Because differences in quality are not taken into account at present when setting the price of raw cotton, it is difficult to raise awareness concerning the problem of having to raise the quality of raw cotton. **Promotion of cotton grading and a grade-based price structure is therefore required as an incentive to raise the quality of raw cotton, and also as a basis on setting prices which correspond to the quality of it.**

(13) Standardization of product specifications and inspection criteria

A uniform series of inspection standards should be established and promoted as soon as possible. One effective means would be to study the experiences of other countries in similar efforts. Standardization of uniform products and quality standards may ultimately require compulsory adoption by industry, but at present such a move would be premature.

(14) Effective approach to R & D

For the time being efforts should focus on strengthening the R & D division of TIRDC, contributing to the improvement of industry-wide technical standards, and strengthening linkage with the textile standardization activities of PSQCA. Work to enhance the R & D division of TIRDC should be carried out as part of overall measures to strengthen TIRDC in line with the suggestions given below under *(14) Directions for Human Resources Development* (Refer to Directions for strengthening of the TIRDC).

Research and development requires talented personnel together with large amount of time and money. Ties with PICRT should be strengthened in order to make the most of a limited staff and budget.

(15) Directions for human resources development

An effective approach to human resources development.

As for the recommended direction for human resources development, the situation in areas where the textile industry has the most problems should be improved. That is: (1) increase the number of middle management and technical experts to promote the training of ordinary workers so that they may become skilled workers. In order to achieve this it is necessary to increase the full number of students and trainee of places available at existing educational and training institutions (those offering courses at diploma level and above); and (2) improve basic education, in particular, increase opportunities for drop-outs to receive re-education and training. More than anything else, if this is to be achieved **an educational training system needs to be put in place which will secure an appropriate number of teaching staff, and also improve the facilities and equipment of educational and training institutions.**

A realistic approach to securing the required number of instructions involves: [1] a review of the salary levels of instructors; [2] improvements to the facilities and equipment of educational and training institutions; and [3] invitations to technical experts from other countries.

The figure below (Refer to Flow of Human Resources Development) illustrates the process through which the number of middle management, technical experts and skilled workers working for companies may be increased by increasing the full number of instructors and students at the relevant institutions. At the same time, it also shows how human resources may be provided to TIRDC and educational and training institutions operated by private organizations.

As for the salary levels of instructors, as pointed out in PART V, 10-3-2 (Shortage of Instructors and Problems), there is clearly a difference between salaries offered by the public and private sectors. Although because different companies offer different salaries and some instructors earn secondary incomes it is difficult to make a simple comparison of the difference in the salaries of instructors and those working in the private sector, a look at their salary levels alone reveals that immediately upon graduation there is a difference of at lease 100%.

As for the next recommendation of installing adequate facilities and equipment and inviting technical experts from other countries, it would seem that the government support, such as increasing budgets, is required here. Inviting experts from other countries makes it possible to absorb the latest technology and up-to-date information and know-how from overseas. In addition to this, as a way of making the teaching profession more attractive and increasing the retention rate of instructors it is necessary to introduce incentives for instructors. This could be done by making a priority of creating opportunities for sending instructors to other countries for training and observation and thereby fulfilling their intellectual requirements.

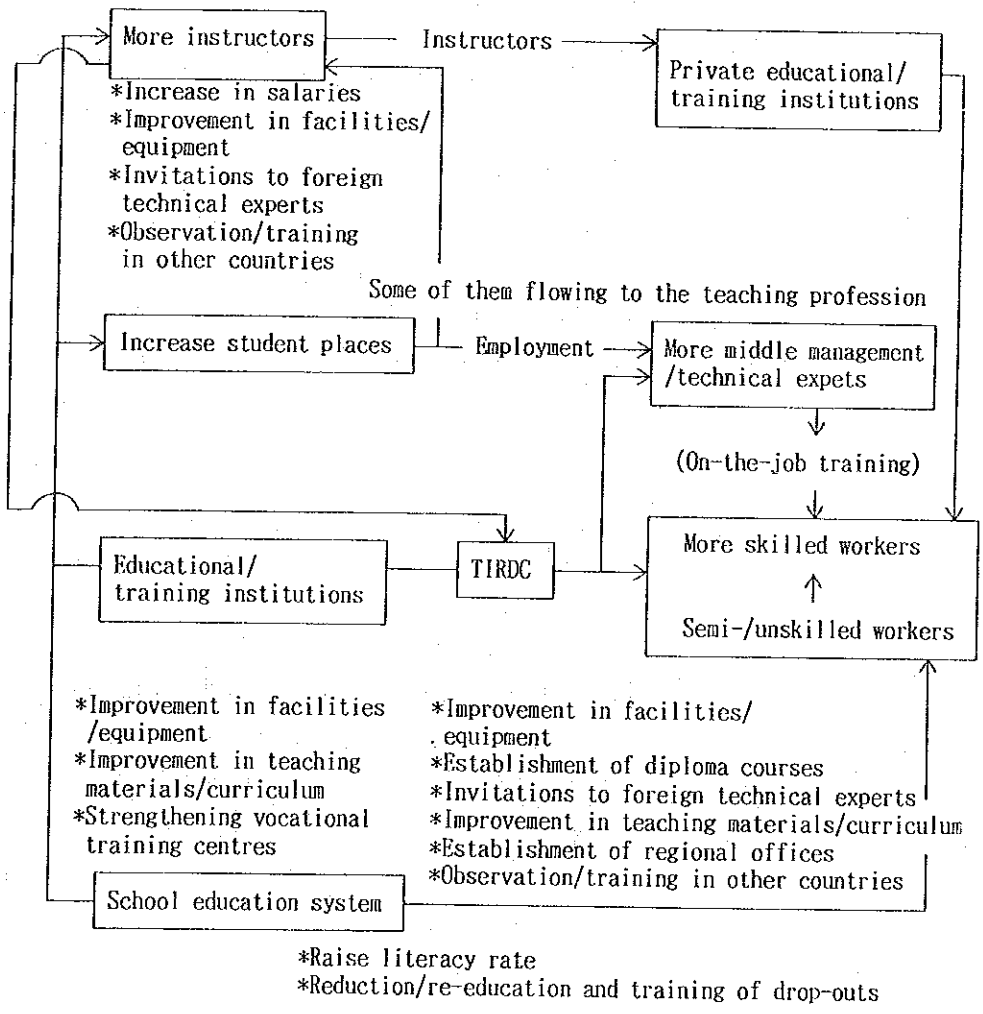
Once the required number of instructors has been obtained, in other words doubling present numbers (59/30

calculated on the basis of Table from 10-3-2), it should be possible to double or more the number of student places available at educational and training institutions at the present time. In cases where this exceeds the annual capacity of the educational or training institutions concerned, it will be necessary to build or expand the education environment (facilities, teaching materials, machinery and equipment, etc.) in order to cover this shortfall. As for the number of middle management and technical experts required by companies, the questionnaire survey carried out when visiting companies revealed that, in general, it will be necessary to increase their numbers by more than 100%.

Efforts to increase the pool of middle management and technical experts will depend to a great extent on provincial government-run educational and training institutions. Consequently, these schools should be strengthened by increasing the number of instructions and improving educational environment.

By increasing the number of middle management and technical experts and the number of TIRDC instructors (Refer to section on directions for strengthening TIRDC below), **opportunities for providing on-the-job training can be expected to increase, and this in turn will lead to the training of skilled workers.**

FLOW OF HUMAN RESOURCES DEVELOPMENT



Cooperation with Textile Industry Association

Cooperation between the relevant government organizations and textile associations is an effective means of carrying out the development of human resources. It is also desirable that public educational and training institutions support the development of colleges established by textile associations (including those planned) by carrying out exchanges of personnel and information. It is also recommended that the government support, such as financial assistance and tax incentives, for the schools and training institutions established by industry be examined.

Directions for strengthening of the TIRDC

TIRDC carries on a broad range of activities in the area of textile-related skills development. It has also formed strong links with the private sector in the course of carrying out its projects. As a result, strengthening the human resources development programmes of TIRDC is expected to have a pervasive effect in a wide range of areas. Other advantages to be gained from strengthening TIRDC include: (1) in its position as a government organization it will be easy for it to receive assistance from the governments of other countries; (2) it can provide a wide range of training and guidance; (3) it will be able to carry out projects on a nationwide scale; (4) it can be expected to play a useful coordinating role with other relevant organizations.

As for the direction which this strengthening should take, it is proposed that: (1) in addition to the planned expansion of facilities; (2) the range of machinery and equipment be expanded; and (3) the number of instructors also be increased. Also, as a means of facilitating the introduction, assimilation, and application of the latest in machine technology and the absorption of know-how it is necessary to (4) implement programmes for the staff to observe conditions and receive training in other countries, and (5) form closer ties with the National College of Textile Engineering (Faisalabad) and APTMA through mutual exchanges of personnel and information. There will also be a need in the long term to (6) establish a system of feeding outstanding personnel (mainly middle management and technical experts) back into the private sector. This would involve upgrading the level of its training and guidance by establishing a diploma course, and conducting mutual exchanges of teaching staff and information with provincial-government-run educational and training institutions.

Training programme for women

Because of their hard-working and methodical nature, women are believed to be able to play an important role in increasing the added value of the Pakistani textile industry and in improving the quality of its products. It follows that efforts toward strengthening training designed to develop women's abilities would contribute significantly to the development of the textile industry in the future. It is of the utmost importance that education and training institutions be made more accessible to women and that preparations to receive them be made.

It is essential that measures for the development of women's abilities be taken such as (1) the creation of courses and curricula for the training and guidance of women by establishing a new Garment Training Centre (GTC), and (2) the expansion and strengthening of training (textile industry related) for women in nationwide vocational training centres under the jurisdiction of the National Training Board (NTB). Training and guidance by GTC in garment design (including fashion), as a field in which women can be particularly expected to demonstrate their abilities, would be effective. Training and guidance in knit and sewing techniques for women as skilled factory workers by nationwide vocational training centres would similarly be effective.

(Example)
The National Vocational Training Project which is being supervised by the National Training Board plans to establish five Women's Training Technical Centres around the country by 1995, and to offer five courses. In relation to textile, courses being established include a course on dress making and designing (this course has already been established in some centres)

The National College of Textile Engineering has expressed its desire to establish a knitwear and garment course, providing that funds are available. The APTMA school in Karachi also plans to commence education and training for women related to fashion and design. From the perspective of creating employment opportunities for women alone, it is desirable that such steps be taken as soon as possible.

(16) Environment programme

In addition to restricted sources of water, the anticipated development of industry in the future is expected to bring with it problems in obtaining water for industrial use. It is also highly probable that industry will have to compete with water for normal household use. It will therefore be necessary to allocate resources to the securing and effective use of water sources in the future.

As for the disposal of industrial waste water, it is desirable to establish detailed guidelines on effluent based on international standards and to ensure that they become universally adopted. With regard to dyeing in particular, much care must be taken in the treatment of waste water, and to this end it is recommended that examination be given to a project for the construction of a dyeing industrial estate at some time in the future. By doing this it will be possible to integrate the control of waste water disposal. It will also make it possible to secure water for industrial use and ensure that it is used efficiently. It is recommended that such consideration be given to creating a minimum impact on the environment.

In the present day and age when the environment has become a problem of global proportions, industries in every country around the world are showing a high level of concern for this problem. By forming economic links with foreign companies the Pakistan textile industry is expected to come into closer contact with such environmental problems. **It is essential that as the textile industry develops in the future it forms ties with other countries so that it can accumulate know-how and learn from the experiences of these other countries in relation to the protection of the environment.**

2-3. Promotion Programmes

2-3-1. Details and Frameworks of the Promotion Programmes

Briefly, the biggest problem encountered by the textile industry of Pakistan is the low level of quality of products in all sectors from the upstream to downstream sector. The main reason for this low level, as has already been pointed out, is the absolute shortage of the engineers and technicians who form the backbone of factories, and their poor level of existing expertise for basic technology, production technology and management. In order to remedy the above, a systematic reinforcement of technical instruction and personnel training needs to be undertaken by cooperation between the government and the industry in order to support the general efforts undertaken on an industrial basis.

Moreover, the delay in modernization of the weaving and dyeing-finishing sectors acts to block the supply of materials necessary for upgrading of the garment industry, and so creates an obstacle to the balanced development of the textile industry. Therefore, an important task to be carried out in conjunction with government policy, is the modernization of facilities and reinforcement of the industrial base of the independent weaving and dyeing-finishing units in the nonmill sector.

Further, the promotion of standardization is needed in order to achieve an improved quality and upgrading of finished products, which is needed in turn to help raise the international standing of Pakistani products.

In view of the above, the following concrete programmes are proposed.

(1) Reinforcement of Systems for Technical Instruction and Personnel Training

(1-1) Technical Upgrading Supporting Programme for Textile Up- and Midstream Sectors
(1-2) Technical Upgrading Supporting Programme for Small and Medium Scale Textile Industries in Punjab Area
(1-3) Technical Upgrading Supporting Programme for Garment Sector

(2) Modernization of Facilities and Structural Reform in the Nonmill Sector

(2-1) Financing Scheme for Modernization of Textile Industry
(2-2) Financing scheme for Groupings in Textile Industry

(3) Promotion of Standardization for Quality Improvement of Finished Products

(3-1) Standardization of Inspection Programme

Table VI-2-2 indicates the outlines of the promotion programmes with preconditions for implementation and organizational frameworks involved. The following are detailes of the individual programmes.

(1) Reinforcement of Systems for Technical Instruction and Personnel Training

In order to overcome the various problems encountered by individual firms, the reinforcement of technical instruction and personnel training are requirement at the root. The efforts of individual firms are very important. However, since there are obvious limits to what individual firms can actually achieve in this direction it is necessary to strengthen or found supporting bodies to further strengthen personnel training. In terms of importance the following three measures need to be undertaken to reinforce existing systems.

A. Upgrading of engineers and technicians working in the spinning, weaving and dyeing-finishing industries.
B. Technical training for the Nonmill Sector weaving firms and related processing industries.
C. Technical development for the garment industry.

While an overall improvement in the technical levels of the upstream and midstream sectors, that is spinning, weaving and dyeing-finishing, needs to be carried out, particular attention to the upgrading of dyeing-finishing technology is required with a view to supporting the technical advancement of the garment industry. The TIRDC already exists as a public institution responsible for providing training and education for the upstream and midstream sectors, and it has carried out activities on a national scale with great energy and efficacy. It is therefore considered appropriate to make use of the facilities and services of the TIRDC to support the upgrading of the technical expertise of the upstream and midstream sectors. However, since still the facilities and personnel line up of the TIRDC are considered insufficient in a number of areas in terms of the technical range and efficacy of the training to be given, it will be necessary to undertake modernization of its facilities and reorganization of personnel so as to reinforce and expand training functions.

In the weaving sector, the independent small and medium scale businesses are more numerous and play a much more important role than in the weaving section of the integrated mill sector. Nevertheless, the technical levels of these small and medium scale businesses and their related processing sectors (such as for dyeing-finishing, sizing, etc.) are extremely backward. Despite this fact there is little provision for guidance or training directed to these firms. Training and guidance of a different type from that made applicable to the mill sector needs to be provided. Such training and guidance requires to be tailored to the actual technical situation of these sectors concerned, and the regional nature of their sites. However, the TIRDC is concerned with providing guidance and training to the mill sector and is intrinsically not conforming in some respects to the needs of these small and medium scale firms. Further, since these small and medium scale units are largely concentrated in the Faisalabad region there are geographical problems posed to their use of the TIRDC which is located in Karachi. In view of the above reason, it is considered necessary to establish a new institute for technical guidance to serve the small and medium scale firms and their related subcontract processing sectors located in the Punjab region centering around Faisalabad.

Table VI-2-2 SUMMARY OF PROGRAMMES (1/4)

Programme Task	Programme	Programme Outline	Preconditions for Implementation	Organizational Framework
(1) Reinforcement of systems for technical instruction and personnel training	(1-1) Technical Upgrading Supporting Programme for Textile Up- & Mid-stream Sectors	To expand and upgrade the public services such as technical guidance, testing and dissemination of improved technology provided to the industries by TIRDC so as to upgrade technological standards and product quality in general. Training functions addressed to engineers, in particular, are to be reinforced and thereby improvement of production technology of firms is to be supported. While aiming at strengthening the training functions for spinning, weaving, knitting and dyeing-finishing sectors, emphasis will be given to the dyeing-finishing sector. Retraining of currently employed engineers will be the main job. Supplementary equipment for training as necessary shall be installed in addtion to the existing facilities.	1. To increase in the number of instructors in TIRDC. 2. To secure running budget to support continued training activities. 3. Industrial associations are to be involved in coordination and implementation of the Programme.	1. The existing organization, structure and facilities of TIRDC are to be used 2. Coordination and monitoring of the Programme: To be done by the Textile Policy PlanningUnit in MOI. 3. Programme implementation: TIRDC shall be in charge.
	(1-2) Technical Upgrading Supporting Programme for Small & Medium Scale Textile Industries in Punjab Area	To establish a new institute in Faisalabad, where independent weaving mills and ancillary industries are concentrated, to undertake technical guidance and training for the Non-mill sector. The capacity to supply raw materials for Garment sector shall be strengthened through providing guidance for modernization of production which matches the actual situation of the firms in this area. Training will be focused on weaving and dyeing-finishing. Major trainees should be factory managers, engineers	1. To undertake a survey on the status-quo of the Non-mill sector and clarify the priorities for training programmes based on the expected effects. 2. To integrate the views and policies of the related industial organizations in implementing the programme 3. To clarify the role of NCTE, the division of functions and relative positions of TIRDC and the envisaged institute.	1. Running of the institute is to be trusted with a joint body consisting of members from the MOI, NCTE and the related industrial organs. 2. Coordination and monitoring of the Programme: To be done by the Textile Policy Planning Unit in MOI. 3. Programme implementation: The envisaged institute will be the implementing body. The executive body

Table VI-2-2 SUMMARY OF PROGRAMMES (2/4)

		and technicians of Non-mill sector. The institute shall be located in the premises of NCTE so that close cooperation with the college could be achieved and college staffs and facilities could effectively be made use of.		should be formed as soon as possible.
	(1-3) Technical Upgrading Supporting Programme for Garment Sector	To establish a Garment Technology Training Centre to undertake systematic training of engineers and technicians for Garment Industry. The Centre will be equipped with a model factory where practical training as well as basic training is performed. Students who have finished secondary or high school or completed two year college education will be the major trainees. Training will consist of sewing, the pattern making, production control, sales management, a.s.o. (Subsequently the training of fashion designers is envisaged.)	1. To establish the interior organizational structure of the relevant industrial association which is to be the implementing body 2. To ecruit and train the instructors for the training and educational courses. At beginning, in particular, assistance from foreign experts shall be utilized. 3. To secure enough budget to meet the running cost and expenditures for equipment maintenance so that training activities could be continued.	1. Coordination and monitoring: The Textile Policy Planning Unit in MOI shall be responsible. 2. Programme implementation: A particular industrial organization whom MOI will trust to run the Centre shall be executing body. Promotion of the Programme shall start after the cooperational system between MOI and the industrial organization is established.
(2) Modernization of facilities and structural reform in the Non-Mill Sector	(2-1) Financing Scheme for Modernization of Textile Industry	To provide a low interest financing in order to promote investment for modernization by the small & midium scale textile related firms, in particular those in the weaving sector where modernization is related, and promote new investment and investment for modernization in the Dyeing-finishing sector as well.	1. To conduct special surveys on the status-quo of the industry, requirement for fund, possibility of raising fund a.s.o. 2. To select a public financing body which has enough experience and expertise in financing small & medium scale firms as a conduit.	1. Financing comes under the jurisdiction of the Finance Ministry, but since this program is a part of promotion policies for the textile industry a joint coordination team consisted of the Treasury and the Textile Policy Planning Unit in MOI should be established to promote the project. 2. Coordination & monitoring: The joint team mentioned

Table VI-2-2 SUMMARY OF PROGRAMMES (3/4)

				above shall be responsible. 3. Implementation body: An appropriate DFI is to be nominated (A possible option is IDBP.)
	(2-2) Financing Scheme for Groupings in the Textile Industry	To provide a low interest and long-term financing to help promoting cooperation, joint operation, grouping of factories among the small and medium scale firms of the same kind of business including related processsing firms engaged in weaving, knitting, dyeing-finishing and ancillary industries in order to strengthen the corporate structure and promote their modernization and structural reform.	1. To conduct special suveys on the status-quo of the industry, requirement for fund, possibility of raising fund a.s.o. 2. To select a public financing body which has enough experience and expertise in financing small & medium scale firms as a conduit. 3. To activate the movement for groupings and joint operation among the firms in the Non-mill sector.	1. Financing comes under the jurisdiction of the Finance Ministry, but since this program is a part of promotion policies or the textile industry a joint coordination team consisted of the Treasury and the Textile Policy Planning Unit in MOI should be established to promote the project. 2. Coordibnation and monitoring: The joint team mentioned above shall be responsible. 3. Implementing body: An appropriate DFI is to be chosen (a possible option is IDBP).
(3) Promotion of standardization for serve quality improvement of finished products	Standardization of Inspection Programme	Reinforcement of standards and promotion amongst firms for the inspection methods so as to upgrade the international evaluation of Pakistan's finished textile products and enhance exports thereof. Activities will be directed at securing an accurate pictureof the quality levels throughout Pakistan and encouraging greater consciousness of the	1. Collection and analysis of data relating to the international rating of textile products, survey to identify the current position of Pakistan's textile industry in the world context. 2. Establishment of a policy of industrial guidelines for standardization and inspection	1. Furthering and monitoring of the Program; to be carried out by the Textile Policy Planning Unit in MOI 2. Programme implementation: PSI to act as the central executing body.

Table VI-2-2 SUMMARY OF PROGRAMMES (4/4)

		need to increase product quality. Promotion and diffusionof standardi-zation to be carried out under guidance from overseas experts so as to assimilate the experience and expertise possessed by the developed nations.	systems.	

The garment and knitwear sectors are similar to assembly processing industries and so differ slightly in technical nature compared to the yarn and fabrics sectors. These sectors have shown development recently in Pakistan and most output is for export. The biggest task facing these sectors is how to upgrade the export items, and this entails the problem of how to nurture personnel with the basic technical expertise needed to achieve this. Since the textile industry is labour intensive it is advisable to have operator training carried out largely on an in-house system, but to create in house staff equipped with the basic expertise of garment production needed to direct operations, a specialized training institute is required. The existing training centres are to technical high school level and NCTE and TIRDC put emphasis on the technical expertise needed for production of yarn and fabrics. In view of the actual situation and nature of the garment industries the establishment of an independent training institute to undertake personnel training for this sector is desirable.

(1-1) Technical Upgrading Supporting Programme for Textile Upstream and Midstream Sectors

A. Objectives

The present programme will carry out an upgrading of technical expertise in the industry through the training or retraining of the mid ranking engineers and technicians of upstream and midstream firms. This will contribute to improving the production technology of the industry and so support the overall upgrading of technology levels in the textile industry.

Emphasis will be given to strengthening the dyeing-finishing sector. More specialization will be given to the training relating to production technology for the spinning and weaving sectors.

B. Site

The site will be that of TIRDC in Karachi. However, since there is a plan to move TIRDC from its present site within Karachi city, construction of the buildings for this present programme will proceed on the assumption of TIRDC relocation plan to a new candidate site.

C. Details

TIRDC with its record of short term training achievements to date is to be employed as the implementing institute for the retraining or training of industrial engineers and technicians. Reinforcement and installation of training equipment and staff reinforcements are to be carried out in order to strengthen TIRDC's training capacity.

C-1. Trainees envisaged

Personnel of the following levels are envisaged as candidate trainees;
- engineers and technicians currently engaged in production activities in factories
- candidates with at least technical college education and working experience
- personnel recommended by firms

C-2. Details of Training

Since the present programme is designed for personnel with industrial experience and with the objective of improving the level of production technology currently wanting in Pakistan's textile industry, training which will contribute directly to production is above all necessary. However, since there are limits in the training if it utilizes fully actual factory or shop production facilities and conditions, it will be necessary to determine the main points of training so as to make the most of the conditions given at TIRDC. Detail Plan VI-11 gives an outline of training details designed with the above in mind.

C-3. Training Courses

Examples of envisaged training courses are shown in Detail Plan VI-12. Other courses could be set up as appropriate and in accordance with the needs and requests of industry.

C-4. Training Equipment

Reinforcement and modernization of training equipment for all sectors of spinning, weaving (knitting), and dyeing is to be undertaken. Equipment required for training is shown in Detail Plan VI-13.

C-5. Staff Programme and Visiting Experts

Training staff for each sector are to be increased and by that means the organization reinforced. Detail Plan VI-14 shows the staff required for implementation of the project.

Experts are to be invited from overseas to perform technical instruction of the specialist staff. Detail Plan VI-15 gives an outline of the overseas experts to be hosted.

D. Building Area and Facilities Plan

TIRDC plans to move from its present location. The present project has been designed on the assumption of this transfer, and so supposes that a transfer site will be obtained and construction of buildings be completed. Detail Plan VI-16 shows the plan for facilities based on the details of the training programmes envisaged as in the above. The required building area is approximately 4,000 square metres.

E. Estimate of Required Capital

Building	approx. US$ 0.8 Million (approx. Rs. 20 Million)
Machinery and equipment	approx. US$ 4.5 Million (approx. JY. 580 Million)
Furniture and fixtures	approx. US$ 0.4 Million

F. Organizational Framework and Monitoring System

The promotion and monitoring of the present programme is to be carried out by the textile policy units in the Ministry of Industries (MOI) which will be assigned with these activities. Implementation of the programme will largely be carried out by TIRDC under the guidance of MOI. It is desirable to position specialist staff for the purposes of implementation.

In order to ensure that the progress and implementation reflects the needs of the industrial sectors to be served the cooperation of the various industrial bodies should be secured and representatives of the industrial sector should be involved.

G. Schedule

Total Implementation (from go ahead decision) : about 3 years
- Recruitment and training of teaching staff : about 1.5 years
- Construction of buildings and facilities : about 1.5 years
- Purchase, installation and transfer of materials, equipment and auxiliary items : about 2 years

H. Aspects of Programme Furtherance needing Consideration

Even if there is a latent demand for personnel training in the textile industry, the present programme will not succeed unless the trainee candidates are enlisted and first class instructors made available. It is therefore necessary to establish the prospects for programme success beforehand by obtaining the participation and cooperation of industrial organizations and carrying out a survey on the number of personnel which individual companies would like to have participate in the training courses.

A necessary condition for the success of the programme is the provision of first class instructors. Therefore it is necessary to verify that such instructors will be definitely forthcoming to assure the prospects of programme success.

In order to assure that there is no halt to projected activities and maintenance or replacement of equipment because of a lack in running expenses, **it is necessary to ensure the continuous availability of a budget to meet necessary running costs through securing an income met by the beneficiaries in the form of training fee income and contributions from the industry, or as Government subsidies.**

[Detail Plan VI-11]

Details of Training for the TIRDC

The TIRDC already holds training courses and implements technical instruction. Acting to reinforce existing courses, the new courses to be established under the present programme should give special emphasis to upgrading the technical levels of the dyeing finishing sector. In addition to this training should be accorded to maintenance technology of the spinning sector, to changing over to shuttleless looms in the weaving sector, and to knitting technology in the knitwear sector. Courses will consist of practical training and lectures, but since there will be cases where it is not practical to use the actual production machinery of factories, training will need to be carried out using equipment appropriate for providing the basic experience necessary.

Spinning

(1) Maintenance practise for spinning machines

Carding machine maintenance
Comber maintenance
General maintenance technology

(2) Production management

Quality control and standardization
Processwise production calculation method
Yarn defects and testing/inspection
Training of operator and safety management

Weaving

(1) Technology of weaving and weaving machines

Grey yarn and textile weave
Thickening agent, size mixing and waking
Warping and sizing technology
Heald hook and loom component parts

(2) Weaving practise

Mixing and production of sizing agent
Warping and sizing
Heald hook
Overhaul practise of a loom
Weaving (on shuttle loom, or shuttleless loom)

(3) Production management

Quality control and standardization
Processwise production calculation method
Textile defects and testing/inspection
Instruction for operator and safety management
Mechanism of looms

Knitting

(1) Knitting technology

Knitting technology and knit structure
Principle of knitting and knitting machines
Grey yarn for knitting
Knit design

(2) Knitting practise

Adjustment of knitting machine
Knitting practise
Quality control and production control of knitting
Knit defects and testing inspection

Dyeing-finishing

(1) Basic technology

Dye test for each materials
Dyeing method for each materials
Printing (dye, pigment)

Piece dyeing (continuous, batch)
Fastness test to washing, daylight
Rubbing test

(2) Applied technology

Desizing, scouring, breaching for cotton, polyester/cotton, polyester/viscose
Mercerizing
Shrink proofing of textiles
Resin finishing, sanforizing
Pilling proofing

(3) Production management

Procurement and preparation of dyestuff and chemicals
Colour (lightness, chroma) control
Dyed textiles

[Detail Plan VI-12]

Training Course for the TIRDC

Spinning Section

Spinning Equipment Maintenance Technology Course

- Training of maintenance technology required for spinning engineers

Qualified trainee	:	Engineers experienced in maintenance and production for five years or more in spinning mill
Number of trainee and training period	:	10 persons per course; 30 days per course

Spinning Mill Production Management Course

- Training of production management technology required for production engineers in spinning mill

Qualified trainee	:	Engineers experienced in production for five years or more in spinning mill
Number of trainee and training period	:	20 persons per course; 14 days per course

Weaving Section

Weaving Preparation Technology Course

- Training of basic technology required for weaving preparation engineers

Qualified trainee	:	Middle class engineers experienced in production for three years or more in weaving mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Weaving Technology Course

- Training of technology required for weaving engineers

Qualified trainee	:	Middle class engineers experienced in production for three years or more in weaving mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Weaving Equipment Maintenance Technology Course

- Training of maintenance technology required for maintenance and production engineers in weaving mill

Qualified trainee	:	Middle class engineers experienced in production for five years or more in weaving mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Weaving Mill Production Management Course

- Training of production management technology required for production engineers in weaving mill

Qualified trainee	:	Middle class engineers experienced in production for five years or more in weaving mill
Number of trainee and training period	:	10 persons per course; 14 days per course

Knitting Section

Knitting Technology Course

- Training of knitting and production technology required for production engineers in knitting factory

Qualified trainee	:	Middle class engineers experienced in production for three years or more in knitting mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Dyeing-finishing Section

Basic Dyeing Technology Course

- Training of basic technology required for dyeing engineers

Qualified trainee	:	Middle class engineers experienced in production for five years or more in dyeing factory
Number of trainee and training period	:	10 persons per course; 20 days per course

Dyeing Production Technology Course

- Training of production technology required for production engineers in dyeing factory

Qualified trainee	:	Engineers and technicians experienced in production for five years or more in dyeing factory
Number of trainee and training period	:	10 persons per course; 20 days per course

Dyeing Production Managment Course

- Training of production management control technology required for production engineers in dyeing factory

Qualified trainee	:	Engineers and technicians experienced in production for five years or more in dyeing factory
Number of trainee and training period	:	10 persons per course; 20 days per course

[Detail Plan VI-13]

Equipment List for the TIRDC

Spinning

(1) Card maintenance equipment

A	Grinder for card	
	Flat grinding machines (on carding engine)	2
	Flat grinding machine (long roller system, cup grinding system)	2
	Traverse grinder (cylinder, doffer)	2
	Bare surface grinder (cylinder, doffer)	2
	Diamond grinder for grinding stone	1
B	Wire mounting machine	
	Mounting apparatus for cylinder doffer	1
	Mounting & grinding machine for licker-in roller	1
	Flat clipping machine	1

C Others

Flat glazing apparatus	1
Flat milling machine	1
Dynamic balancer for cylinder	1
Burnishing roller	1
Stripping roller	1
Side scope for wire	3
Gauge plates	1

(2) Top roller maintenance equipment

Treatment machine for roller cot (H_2SO_4)	1
Treatment machine for roller cot (ultraviolet-lay)	1
Grinding machine for roller cot	1
Eccentricity tester for top roller	1
Assembling machine for top roller	1
Hardness tester for top roller	1
Roller presser tester for roving & ring spinning	1

(3) Machinery and equipment

Carding machine	1
Sliver lap machine	1
Ribbon lap machine	1
Comber	1
Drawing frame	1
Simplex fly frame	1
Ring spinning frame	1
Automatic cone winder	1

(4) Testing equipments

Fibrograph	1
Portable moisture meter	1
Yarn evenness tester	1
Fluff inspector	1
Twist tester (Electric drive)	1
Package density tester	1
Length measuring apparatus	1
Lea strength tester	1
Wrap reel	1

Weaving

(1) Lab preparation machinery

Size cooker	1	200l, electric heater
Single yarn sizer	1	creel, sizing, flyer, winder
Sample warper	1	warp length 60m

(2) Looms and relative facilities

Air jet loom	1	reed width, 190cm, tappet type, with 2 each of beam and cloth roller
Projectile loom	1	reed width, 190cm, tappet type, with 2 each of beam and cloth roller
Warp tying machine	1	flame width 220cm
Reaching machine	1	flame width 220cm
Beam and heald carrier	1	battery type
Cloth inspecting machine	1	for both transmission and reflection
Pirn winder	1	4 spindles

(3) Testing equipment and instruments

Cloth strength tester	1	
Bursting strength tester	1	
Thickness meter	1	
Micro balance	1	
Refractometer	1	for size
Viscosity meter (Spindle type)	1	
Portable tension metre	1	
Stroboscope	1	
Electrostatic charge eliminator	1	

The following machines existing in TIRDC are utilized for the programme

Automatic cop change loom
Narrow loom (Ribbon weaver)

Laboratory type sizing machine (Shirley type)
Tachometer
Moisture meter (Shirley)

Knitting

Circular knitting machine	1	26 inch dia., 20 gauge
Rib knitting machine	1	16 inch dia., 18 gauge
Single jersey knitting machine	1	30 inch dia., 20 gauge
Interlock knitting machine	1	30 inch dia., 20 gauge
Single testing machine	1	3.5 inch dia., 20 gauge
Flat knitting machine	1	40 inch dia., 7 gauge
Knitting cloth inspection machine	7	Double sided

Dyeing-finishing

(1) Machinery and equipment for laboratory

High temperature pot dyeing machine	1	
Laboratory piece dying machine for rope type	1	max.140°C, cloth capacity 5kg
Mangle for continuous machine	1	
Dryer	1	
Washing machine	1	

(2) Testing equipment and instruments

Fede-o meter	1	xenon lump
Landan meter	1	
Fixo test meter	1	
Pilling test	1	
Crease recovery tester	1	
Flammability tester	1	
Viscosity meter (spindle type)	1	
Grey scale	1 set	
PH meter (digital)	2	
Moisture meter (digital)	1	

The follows equipment existing in TIRDC are utilized for the programme.

Cheese dyeing machine
Winch for laboratory
Jigger for laboratory
Laboratory padder
Heat setting machine
Colour matching machine
Rubbing fastness tester

[Detail Plan VI-14]

Personnel Plan for the TIRDC (Instructor)

Current staff of TIRDC is 17 persons. The following personnel reinforcing plan has been envisaged intending an expansion of its capacity. The planned size of personnel is the prerequisite for implementing the Programme.

	Spinning Section	Weaving/ Knitting Section	Dyeing/ Finishing Section	QC/IE*1) Section	Marketing Section
Department Head	1	1	1	2	1
Senior Development Officer	2	2	2	3	-
Research Development Officer	3	2	2	4	2
Development Assistant	2	2	2	1	2
Subtotal	8	7	7	10	5

*1) Quality Control and Industrial Engineering

Administration

Secretary	1
Clerk	Several
Supporting Staff	Several

Total Number of Personnel Approx. 50 persons

[Detail Plan VI-15]

Foreign Experts to be Hosted

Spinning Maintenance Engineer

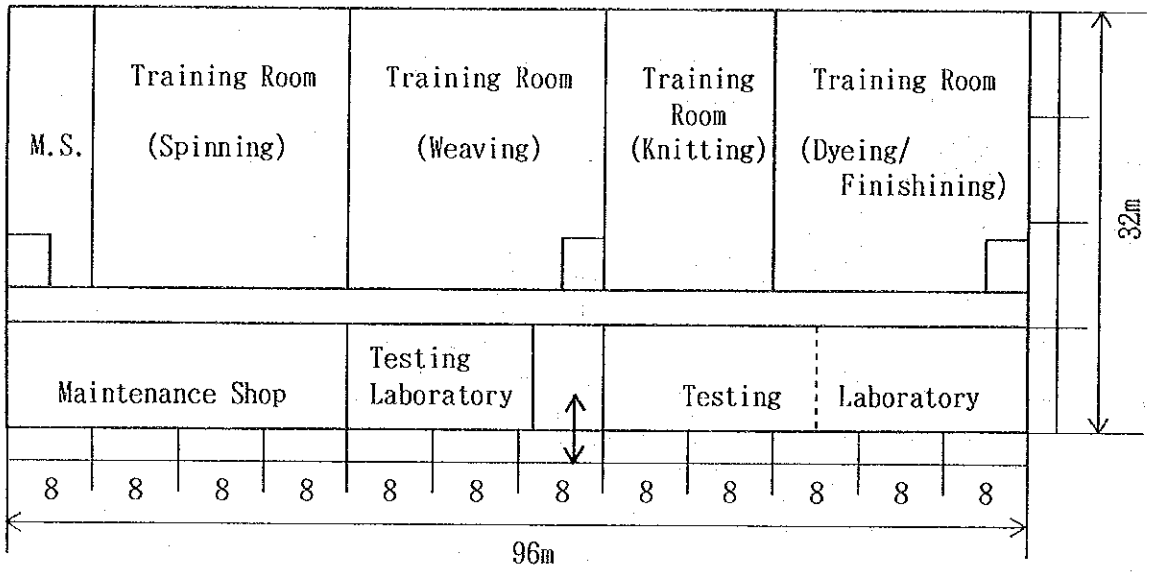
Weaving Engineer

Knitting Engineer

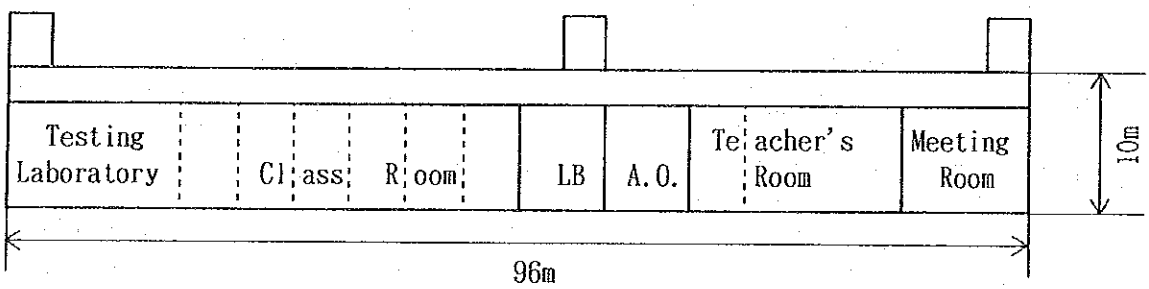
Dyeing-finishing Engineer

[Detail Plan VI-16]

The TIRDC Building Plan



Ground Floor



1st Floor

A.O. : Administration Office
LB : Library

Ground Floor	96m x 32m =	3,072m²
1st Floor	96m x 10m =	960m²
		4,032m²

(1-2) Technical Upgrading Supporting Programme for Small and Medium Scale Textile Industries in Punjab Area

A. Objectives

To carry out training of the engineers and technicians of independent weaving industries of the Non-Mill Sector and of the related dyeing-finishing firms which are concentrated around the region of Punjab area. In this way the technical levels of these sectors will be upgraded and the quality and supplying capacity for garment materials be improved.

Instruction to modernize production technology is to be provided keeping in mind the industrial and regional situation and giving emphasis to weaving and dyeing-finishing technology.

B. Site

To be located in the Faisalabad region since the independent weaving firms and related dyeing-finishing firms are concentrated here. With a view to making use of the existing facilities and staff of NCTE it is assumed that the training centre will be established on the grounds of this College.

C. Details

A new Weaving Technology Centre is to be founded to carry out training tailored to the particularities of the firms and region concerned, and to provide technical training and instruction for engineers of the independent weaving shops and managers of small industries who have not enjoyed the chance to acquire a systematic technical education. This centre will be set up within the groups of NCTE and administered by this, making use of existing specialist staff and equipment of NCTE. Training will be carried out on commission from firms for a set fee. Further, it should be considered whether the facilities can be made accessible for use in the in-house training carried out by firms in so far as this does not interfere with the Centre's own training programmes.

C-1. Trainees envisaged

The candidate trainees will be engineers and technicians working in the independent weaving firms and related dyeing-finishing firms. Such personnel do not enjoy the same opportunities for technical guidance and instruction enjoyed by their counterparts in the mill sector. Managerial staff of small scale businesses should also be considered as possible trainees.

C-2. Details of Training

Since the programme is to be conceived with the nonmill Sector of the independent weaving firms and related dyeing-finishing shops in mind, the training programme will need to provide basic technological expertise and

training which will help such firms to meet the actual technical problems encountered. Detail Plan VI-21 shows a sample outline of a training programme drawn up with the above in mind.

C-3. Training Courses

An example of envisaged training courses is shown in the Detail Plan VI-22. Other appropriate courses could be added in response to the actual situation.

C-4. Training Equipment

Provisions for equipment are to be made with an emphasis on that for the weaving and dyeing sectors. Detail Plan VI-23 shows the equipment which will be required for envisaged training.

It is desirable to make as much use of existing the equipment and facilities of NCTE as possible as long as this does not interfere with the experimentation and training of the College students proper. Nevertheless, equipment considered necessary to realize the objectives of the present programme should be newly installed for use by the training centre outlined here.

C-5. Staff Programme and Visiting Experts

It is essential to secure the auxiliary staff required for the training centre under consideration. Detail Plan VI-24 indicates the staff numbers which will be necessary to implement this programme. In addition to the staff specially recruited, a certain number of the teaching staff of NCTE could also undertake teaching duties concurrently in this centre.

Technical guidance for the staff itself could be carried out by overseas experts invited for that purpose for a certain period of residence. An outline of such experts to be hosted is given in Detail Plan VI-25.

D. Building Area and Facilities Plan

The training centre under consideration should be accorded status as an independent department located on the campus grounds of NCTE of Faisalabad. Detail Plan VI-26 is an outline plan for the centre buildings on the basis of the above training details. The building area required would be about 2,000 square metres (ground floor 1,500 square metres and 1st floor 500 square metres).

E. Estimate of Required Capital

Building apporx.	approx. US$ 0.4 Million (approx. Rs. 10 Million)
Machinery and equipment	approx. US$ 1.5 Million (approx. JY. 190 Million)
Furniture and fixtures	approx. US$ 0.2 Million

F. Organizational Framework and Monitoring System

Running of the centre is to be delegated to a joint managing board consisting of members from MOI, NCTE and related industrial organizations.

The promotion and monitoring of the present programme is to be carried out by the textile policy unit of MOI. NCTE will be the executing body carrying out actual implementation of the programme.

At commencing the promotion and implementation of the programme, the policy for guidance of relevant industrial sectors, which will benefit from the programme, is to be established; sufficient consultation is to be made with the various industrial bodies concerned to ensure that their views and wishes are adequately integrated.

G. Schedule

Total Implementation (from go ahead decision) : about 2.5 years
recruitment and training of teaching staff: about 1 year
construction of buildings and facilities : about 1.5 years
purchase, installation and transfer of
materials, equipment and auxiliary items : about 2 years

H. Aspects of Programme Furtherance needing Consideration

In order to ensure the present programme produces positive results, a preliminary survey of the Nonmill sector which will be concerned by the programme is to be undertaken in order to forecast the programme results and clarify the main emphases for instruction. On the basis of the survey results the instruction policies to be adopted for the related industrial sector will be determined. It will also be necessary to conduct a survey to identify the position of the various industrial bodies and the numbers of candidates from individual companies who will be able to take part in the actual training.

As regards implementation and running of the programme NETC will be responsible for the actual implementation. It will therefore need to consider ways to realize the optimum benefits as a training institute giving special attention to the differing roles and functions of the training to be accorded to students on the one hand and to engineers on the other. Further, the position of TIRDC is to be clarified to assure that there is no waste in the running of the project.

Measures will need to be taken to forecast and arrange for beneficiaries to contribute to costs in the form of income from training fees and contributions from the industry so that training activities can be continued and maintained, while the budget of NCTE will need to be increased to meet costs for maintenance and replacement of equipment.

[Detail Plan VI-21]

Details of Training for the Textile Technology Training Centre

The courses of the present programme are designed with the actual situation and modernization of the Nonmill sector in mind. Emphasis in the weaving sector is to be given to practical training relating to shuttle looms (fully or semi automated). Training with shuttleless looms is to be carried out using models which are easily introduced and handled in the power loom sector. Emphasis is also to be placed on weaving preparation. Course curricula for dyeing-finishing technology are to put emphasis on piece dyeing. Equipment needed for such training is to be made available and the infrequently used equipment of the NCTE also employed.

Weaving

(1) Weaving technology and knowledge of weaving machine

Grey yarn and woven fabric structure
Warping and sizing technology
Materials for sizing agent, mixing, production of sizing agent
Heald hook and loom component parts
Variety of looms and their structure

(2) Preparatory weaving technology training

Mixing and production of sizing agent
Warping and sizing with sample warper and warping

(3) Weaving technology training

Disassembling/reassembling of loom (shuttle loom)
Weaving (with shuttle loom and shuttleless loom)
Heald hook

(4) Production control training

Quality control
Inspection of woven fabric
Instruction for operator and work safety control

Dyeing-finishing

(1) Basic technology and production technology

Basic technology and production technology
Dyeing technology of various woven fabrics
- Dyeing (batch dyeing and continuous dyeing)
Colour fastness tests (Colour fastness tests to washing, daylight and rubbing)
Desizing and scouring (cotton and cotton-polyester blended fabric)
Finishing works of woven fabric
- Crease resistant finish, shrink resistant finish and softening

(2) Production management of mill

Procurement of dyestuffs and reagents
Control of hue (lightness and chromaticness)
Quality control and standardization
Woven fabric testing after dyeing and finishing

[Detail Plan VI-22]

Training Course for the Textile Technology Training Centre

Weaving Section

Weaving Preparation Technology Course :

- Training of weaving preparation technology required for textile engineers

Qualified Trainee	:	Middle class engineers and leader class technician experienced in production for three years or more in weaving preparation mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Weaving Technology Course :

- Training of basic weaving technology required for textile engineers

Qualified Trainee	:	Middle class engineers and leader class technician experienced in production for three years or more in weaving mill
Number of trainee and training period	:	10 persons per course; 20 days per course

Dyeing-Finishing Section

Dyeing Basic/Production Technology Course :

- Training of basic and production technology required for dyeing engineers

Qualified Trainee	:	Middle class engineers experienced in production for three years or more in dyeing factory
Number of trainee and training period	:	10 persons per course; 20 days per course

Dyeing Production Technology and Production Management Course :

- Training of production technology and management technology required for dyeing factory engineers

Qualified Trainee	:	Engineers and technicians experienced in production for five years or more in dyeing factory
Number of trainee and training period	:	10 persons per course; three weeks per course

[Detail Plan VI-23]

Equipment List for the Textile Technology Training Centre

Weaving Section

(1) Lab preparation machinery

Size cooker	1	200l, electric beating
Single yarn sizer	1	creel, sizing, flyer, winder
Sample warper	1	warp, length approx. 60m

(2) Looms and related facilities

Rapier loom	1	reed width 170cm, with 2 beams
Automatic cop change loom	2	reed width 170cm
Ordinary power loom	4	reed width 170cm, with automatic stoppage
RT winder	1	
Pirn winder	1	
Reaching machine	1	
Cloth inspection machine	1	

(3) Testing instrument and others

Testing instruments	1 set	
Beam carrier	2	
Cloth carrier	2	

Dyeing-Fnishing Section

(1) Machinery and equipment for laboratory

High temperature pot dyeing machine	1	
Laboratory piece dying machine for rope type	1	140°C cloth capacity 5kg
Dryer	1	
Washing machine	1	
Laboratory padder and dryer	1	
Blending machine for paste preparation	1	

(2) Testing equipment and instrument

Balance (digital)	1
PH meter	2
Viscosity meter (spindle type)	1
Landan meter	1
Fede-o meter	1
Rubbing fastness meter	1
Grey scale	1

The equipment installed in NCTE are utilized as listed below:

Screen printing tester
Heat setter
Wince for laboratory
Pin tester for laboratory
Open width continuous dyeing tester

[Detail Plan VI-24]

Personnel Plan for the Textile Technology Training Centre (Instructor)

As shown below, the present staff of the NCTE which is to form the main implementing body of the present programme totals 80 members, with 23 teaching staff (professors, associate professors, assistant professors, lecturers), 42 supervisors (responsible for the operation, maintenance, supervision and practical instruction using the training equipment), as well as 15 general staff.

	Spinning dept.	Weaving dept.	Textile processing dept.	Laboratory	Others
teaching staff (professors, assistant professors, lecturers)	5	2	2	2	12
supervisors (technical, trainign staff)	10	10	9	4	9

These staff members not only undertake the education of students but at present also provided technical advice to firms, and it is believed that it would be possible for them to devote time to the present programme. For the present programme it would be necessary to recruit a Director of the Centre, a small administrative staff, as well as three full time instructors for the weaving sector and three for the dyeing sector (preferably with actual experience in firms), while lectures could be given by NCTE staff concurrently with their NCTE duties.

[Detail Plan VI-25]

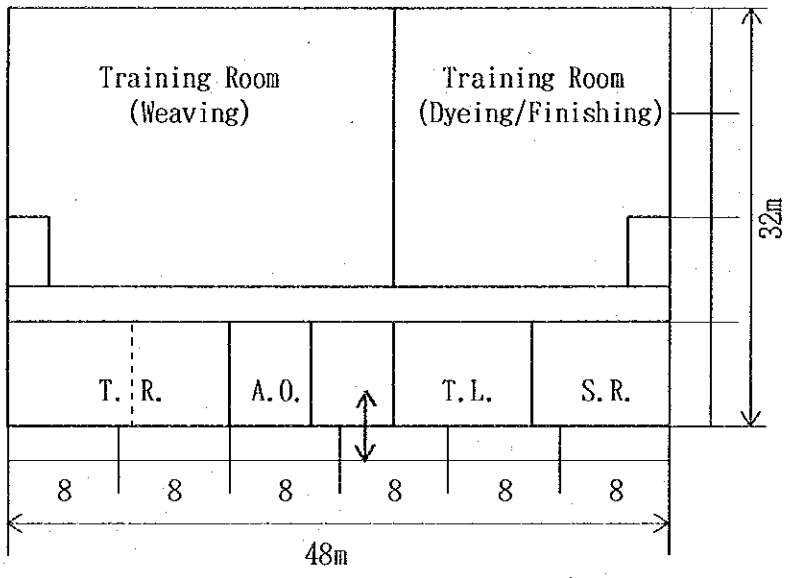
Foreign Experts to be Hosted

Weaving engineer (an engineer with actual working experience in the weaving industry)

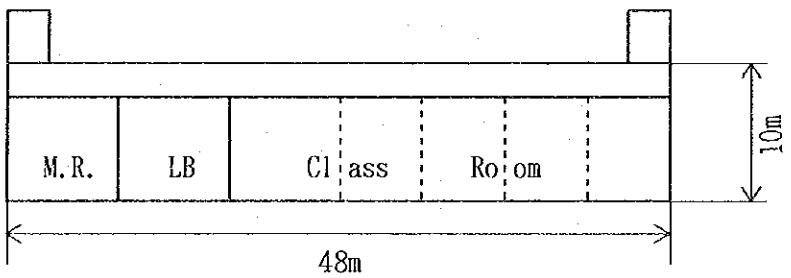
Dyeing engineer (an engineer with actual working experience in the dyeing industry)

[Detail Plan VI-26]

The Textile Technology Training Centre Building Plan



Ground Floor



1st Floor

S.R. : Stock Room
A.O. : Administration Office
T.L. : Testing Laboratory
T.R. : Teacher's Room
LB : Library

Ground Floor 48m x 32m = 1,536m²
1st Floor 48m x 10m = 480m²
2,016m²

(1-3) Technical Upgrading Supporting Programme for the Garment Sector

A. Objectives

This program is to develop and nurture human resources in order to upgrade Pakistani garment quality to a level equivalent or better to the Western markets of the mass retail chain stores and to accomplish further expansion and strengthening of the garment production.

B. Site

The training centre is to be located either in Karachi or its suburbs, since the city acts as Pakistan's international gateway, possesses plentiful labour, and is the focus for the main concentration of the country's garment industry.

C. Details

A Training Centre for Garment Technology is to be set up under the control of the Ministry of Industries (MOI) working in cooperation with related industry.

The following gives an outline of the envisaged Training Centre.

C-1. Trainees envisaged

Candidates eligible to be trainees are graduates of secondary school, high school or two year colleges who intend to go on to become sewing engineers, technicians or managers. It would also be possible to undertake retraining of technicians already working in the industry, but the main emphasis will be placed on the nurture of new personnel resources intending to enter into the industry.

C-2. Details of Training

Training of the present programme is to be carried out in the basic technology in the garment industry for sewing, pattern making, production control, sales management, etc. to be given to trainees who have completed their school education. Detail Plan VI-31 gives an example of the training details.

C-3. Training Courses

An example of the training courses to be implemented in the present programme is shown in Detail Plan VI-32. Since a design technology course can only be set up once the other basic training courses are operating smoothly, it is considered advisable to confirm the necessity of initiating such a course to a later date when this precondition has been realized.

C-4. Training Equipment

The main pieces of equipment which will be required for training are shown in Detail Plan VI-33.

Distinct from the training equipment a model production line should be set up so that training concerning production technology and production control can be carried out through actual production activities.

C-5. Staff Programme and Visiting Experts

Recruitment and training of teaching staff will be necessary for the implementation of the training programme. Detail Plan VI-34 is an outline of the staff numbers considered necessary for the running of the present Centre. It will be necessary to carry out the training of the recruited teaching staff before the beginning of the centre's training courses. Foreign experts will be invited and carry out guidance. Detail Plan VI-35 shows an outline of the experts to be hosted.

D. Building Area and Facilities Plan

Detail Plan VI-36 shows the plan for facilities based on the assumption of the above training details being adopted for the programme. The required building space would be approximately 2,600 square metres. (training zone 1,440 square metres, two storeys; model production zone 1,150 square metres, one storey)

E. Estimate of Required Capital

Building	approx. US$ 0.5 Million (approx. Rs. 12 Million)
Machinery	approx. US$ 1.4 Million (approx. JY. 180 Million)
Furniture and fixtures	approx. US$ 0.2 Million

F. Organizational Framework and Monitoring System

In principle, running of the envisaged Centre would be under the supervision of MOI, while actual running would be accorded to a related industrial organization whom MOI chosen for that purpose.

The textile policy unit of MOI would carry out the promoting and monitoring of the programme. Implementation of the programme would be carried out by the industrial body mentioned above, as the core.

G. Schedule

Total Implementation (from go ahead decision up to commencement of training) : about 3 years
recruitment and training of teaching staff : about 1.5 years

construction of buildings and facilities : about 1.5 years
purchase of equipment and auxiliary items
and their installation : about 2 years

H. Aspects of Programme Furtherance needing Consideration

In order to make the present programme a success the industrial bodies which coordinate the individual firms and play the central role in programme furthering and implementation will need to devote their full enthusiasm and energies. Thereupon **the instructors who are to carry out the training, education and instruction will need to be recruited and actual training initiated.**

In addition to the income received in the form of trainees fees, financial assistance from industry and government subsidies need to be obtained in order to assure that the anticipated costs for integrating trainees who have completed training in the present centre, and to maintain the on going activities of this centre.

[Detail Plan VI-31]

Details of Training for the Garment Technology Training Centre

Basic instruction in the technology of garment manufacture and training on industrial production using a model production line are to be given with the aim of training engineers and technicians who will serve as the back-bone of the Garment Manufacturing Industry. Basic training will give emphasis to sewing technology (use of sewing machines), general technical training in sewing, production management for garments, the garment business and other training required of technicians and managers in garment factories. Practical experience in sewing is to be provided on the model production line. Courses in fashion design are to be started once the above initial courses in basic training are running smoothly, and will be directed to trainees who have completed the above courses.

(1) Basic sewing skill
Knowledge of textiles for garment
Training of basic sewing technology
Training of stitching of parts
Training of sewing various garments
Maintenance of sewing equipment

(2) Sewing skill, overall

Industrial pattern making (patterning, grading and marking)
Spreading, cutting, sewing and finishing
Knowledge of tools for sewing (button, fastener, interlining cloth, sewing thread, etc.)

(3) Garment production management

Process analysis and drawing up a specification sheet
Production process design
Quality control

(4) Garment business

History of dresses and garments
Knowledge of merchandise
Fashion trend
Marketing
Quality control

(5) Design technology

Fashion design
Fashion illustration
Colour image
Fashion drawing

[Detail Plan VI-32]

Training Course for the Garment Technology Training Centre

Garment Technician Bringing-up Course	: Bringing-up garment production technician
Qualified Trainee	: Graduate of eight-year education (junior high school graduate) or higher
Training period	: Day time course one year, 36 hrs. per week Night time Course one year, 15 hrs. per week
Garment Mill Engineers Bringing-up Course	: Bringing-up engineers for overall garment production technology
Qualified Trainee	: Graduate of ten-year education (high school graduate) or higher
Training period	: Day time course one year, 36 hrs. per week
Production Control and Business Course	: Bringing-up production control engineers and sales managers
Qualified Trainee	: Graduate of 12-year education (2 year college graduate) or higher
Training period	: Day time course two years

The following course should be commenced after steady operation of the Centre (minimum two years later):

Fashion Design Course	: Bringing-up Fashion designers
Qualified Trainee	: Graduate of the Garment Mill Engineers Bringing-up Course
Training period	: Two years

[Detail Plan VI-33]

Equipment List for the Garment Technology Training Centre

Training Section

(1)	Stitching machines	24
	1-Needle lockstitch machine with automatic thread trimmer	10
	2-Needle safety stitch machine	2
	Blindstitch machine	2
	Bartacking machine	2
	Automatic pocket welting machine	1
	Eyelet buttonhole bartacking machine	1
	Buttonholing machine	1
	Eyelet buttonholing machine	1
	Chainstitch button attaching machine	1
	Belt-loop making machine	1
	Bartacking machine for belt-loop attaching	1
	1-Needle double chainstitch sewing machine	1
(2)	Finishing machines and others	
	Finishing machine	1
	Steam iron	2
	Electric iron	2
	Vacuum board	4

(3)	Industrial pattern making system (CAD)	1 set
	Computer set, digitizer, plotter	
	Application programme (pattern making, grading making)	

Model Production Line

(1)	Spreading and cutting machinery	
	Cloth inspecting machine	1
	Spreading table	1
	Spreading machine	1
	Electric cutting machine	2
	Fusing machine	1
(2)	Industrial stitching machines	60
	1-Needle lockstitch machine with automatic Thread Trimmer	30
	1-Needle over lock machine	3
	2-Needle safety stitch machine	2
	Blindstitch machine	5
	Bartacking machine	5
	Automatic pocket welting machine	3
	Eyelet buttonhole bartacking machine	2
	2-Needle lockstitch machine	2
	Eyelet buttonholing machine	1
	Lockstitch button attaching machine	2
	Belt-loop making machine	1
	Automatic belt-loop attaching machine	2
	1-Needle double chainstitch sewing machine	1
	2-Needle double chainstitch sewing machine	1
(3)	Finishing machines	
	Steam irons	4
	Electric irons	4
	Vacuum boards	8
	Press machines	2
	Carriers	8

[Detail Plan VI-34]

Personnel Plan for the Garment Technology Training Centre (Instructor)

The estimated number of instructors who will be required for the present programme is shown below. In addition to these, a small number of general administrative staff for general administration and accounting as well as a Director of the Centre will need to be recruited. Either engineers or others with industrial responsibilities or candidates who are graduates from technical colleges and are earnestly motivated to instructing work should be chosen as instructors, and sent for further training abroad and in Pakistan. Eventually the future instructors would be trained from among the graduates from this Centre. On the model line, full time operators should be posted (including supervisors) and the instructors take responsibility for overall administration of the model line as well.

Training Section

	Basic Sewing Technology	Pattern Making Technology	Production Technology	Business	Total
Instructor	4	2	1	1	8
Assistant Instructor	6	2	1	1	10
Subtotal	10	4	2	2	18

Model Production Line

Inspection of fabrics, spreading and cutting	5
Sewing	50
Inspection of product	10
Finishing and Packaging	10
Subtotal	75

[Detail Plan VI-35]

Foreign Experts to be Hosted

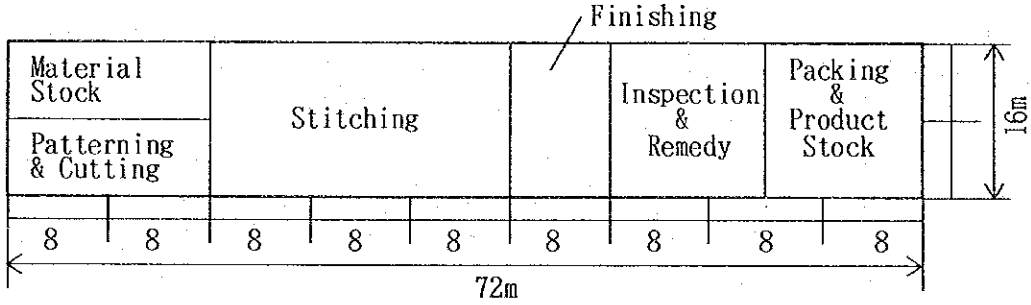
Garment Production Engineer (with equipment maintenance and process analysis technology)

Pattern Fabrication Engineers (with CAD technology)

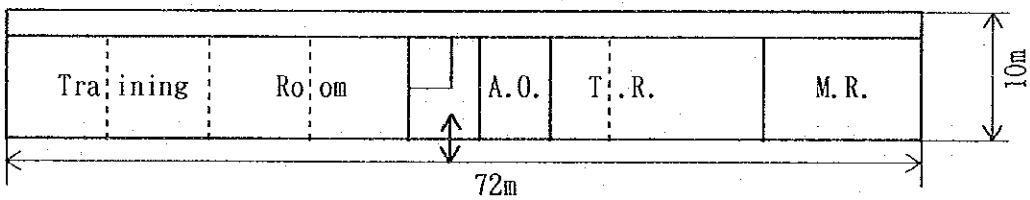
[Detail Plan VI-36]

Garment Technology Training Centre Building Plan

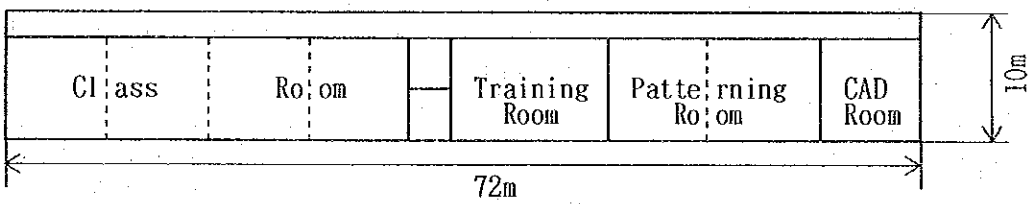
Model Production Zone



Training Zone



Ground Floor



1st Floor

A.O. : Administration Office
T.R. : Teaching Room
M.R. : Meeting Room

Model Production Zone (One Storay)
72m x 16m = 1,152m²

Training Zone
Ground Floor 72m x 10m = 720m²
1st Floor 72m x 10m = 720m²
1,440m²

(2) Modernization of facilities and structural reform in the Nonmill Sector

Independent weaving firms in the weaving sector, especially those in the Nonmill Sector, are in a position to supply materials to the garment sector while at the same time meeting most of the domestic demand and exporting as well. Most of these firms are small and medium-sized enterprises, however, and are unable to fully meet the requirements of the garment sector with their current low levels of technology, low productivity and outdated facilities. Insufficient capacity and outdated facilities in the processing (dying and finishing) sector, the rectification of which is essential for diversification and upgrading of the garment sector, are also impeding development of the garment sector.

Introduction of modern facilities and improving quality and productivity are of primary importance for small and medium enterprises to cut production costs, strengthen their competitiveness and stabilize their operations. However, they are generally weaker in credit standing and fund-raising than big enterprises. They find it difficult to introduce modern facilities because of the financial restraints, which lead to the gap between their productivity and that of larger enterprises. The way is open for these firms to get fixed finance from government-affiliated financial institutions, but some small and medium enterprises find it difficult to meet lending requirements.

Also, most of the independent weaving firms and their vendors are currently located in congested urban areas where they face technological problems, such as flaws on warp produced while transporting beams from sizing plants to weaving mills. In addition, there are various other problems such as detrimental effects on production efficiency, noise and pollution. These small and medium-sized mills scattered in urban areas should be gathered into groups on suburban sites suitable for locating plants, thereby freeing themselves from various impediments. At the same time, they can increase their strength through joint manufacturing processes, joint facilities and other cooperative activities in planned industrial parks.

The following special finance system should be set up to achieve these ends. In advance of drawing up the action plans or implementation of them, an in-depth study on the current situation of the industries, demand for loan fund and possibility of procurement of the fund must be conducted.

(2-1) Financing Scheme for Modernization of the Textile Industry

A. Objective

A special low-interest-rate financing scheme for equipment modernization should be set up for small and medium-sized textile enterprises, especially those in the "weaving sector," which notably lag behind in the modernization of equipment. The loans should also promote new investment, and investment for expansion and modernization of the "processing sector," which is expected to be expanded and modernized further.

B. Lending system (A suggestion)

1) Conduit institutions

The Industrial Development Bank of Pakistan (IDBP) or government-affiliated commercial banks should be appointed as "lending windows."

2) Enterprises qualified

Small and medium-sized enterprises (companies or individuals whose fixed assets amount to no more than 20 million rupees) engaged independently in manufacturing or processing fabrics or knit products and enterprises belonging to ancillary industries should qualify for loans.

Other requirements:

[1] Outdated equipment should be abandoned.
[2] Recommendations should be obtained from industry organizations to which the applying enterprises belong.
[3] Applicants should be enterprises whose ability to borrow normal funds from DFIs or commercial banks is deemed to be difficult.
[4] Large firms should not contribute more than a half of the total investment capital of the enterprises applying for loans.

3) Facilities qualified for loans

Facilities qualified for loans should be designated as necessary by the Minister of Industries for each industry sector and should also meet the following conditions. Land and buildings should not qualify.

[1] The facilities should be new and excellent in performance.
[2] Contracts for their purchase should be made in the same fiscal year in which the loan is to be made.

4) Lending limit and ratio

Lending should be limited to 30 million rupees for each enterprise. The ratio of the loan to the total funds necessary should not exceed 70 percent.

5) Interest rate and term of repayment

The interest rate should be fixed taking into account interest rates and commissions on foreign loans, if any, as well as the cost and margin of the executing financial institutions. It should not exceed 70 percent of the open market rate, however. The term of repayment should be five years (seven years in the case of pollution control

equipment) after a one-year grace period. Repayment should be made in yearly or half-yearly installments after the one-year grace period.

6) Collateral/Credit guarantee

Lending institutions should require physical collateral or credit guarantee by a credit guarantee association (not yet established at present)*)

*) Establishment of a credit guarantee association and a credit insurance corp. are necessary. In view of the insufficient credit standing and ability to borrow of small and medium enterprises, introduction of an official credit reinforcing system should be considered to support them. This matter was touched on previously in "2-2. Recommended Policies".

7) Procedure for applying for loans/consulting

Applications for loans should be submitted to the executing financial institutions. Upon presentation with a loan application, the financial institutions should evaluate or diagnose the operational performance of the enterprises concerned and offer guidance as required. If the lending institution's diagnosis of the plant and equipment investment plan is positive and it is considered to be appropriate to raise funds through this system, the loan will be granted.

8) Time of lending

The actual loan is made when an L/C is opened for importation of the equipment.

(2-2) Financing Scheme for Groupings in the Textile Industry

A. Objective

To promote modernization and structural reinforcement in small and medium-sized enterprises in weaving and knitting sectors, related sectors thereto and in the processing sector, long-term low-interest loans should be made available for the purpose of assisting joint operations, grouping of mills and construction of joint facilities (*).

(*) The All Pakistan Cotton Power Looms Association (APC-PLA) feels that groupings, collaboration and joint operation is possible for small and medium enterprises belonging to the same product category. Collaboration and joint operation involving ancillary industries (warping, sizing etc.) is also believed possible.

In Japan, textile manufacturers in the Enshu region set up a cooperative business association called "Export Fabric Marketing and Utilization Association Limited Eikyusha" in 1923 to establish joint facilities for sizing, processing and trial weaving, and to venture into joint sales promotions. Such moves were influenced by the "Industrial Association Law," which permitted joint purchases of raw materials, joint operations, joint marketing and other cooperative activities. At Fukuda in the Enshu region, another cooperative business association called the "Velveteen and Corduroy Marketing and Utilization Association Tenryusha" was established, and in southern Osaka prefecture there were moves to set up joint sizing mills and warehouses in every county.

Unlike the "guilds" (associations mainly for export inspection), the "industrial associations" initially were not permitted to conduct inspections. The above-mentioned "Eikyusha" and other industry associations petitioned the authorities to allow them to perform inspections, resulting in the 1925 "Important Export Products Industrial Association Law" which permitted the establishment of new industrial associations that could both operate jointly and conduct inspections. By 1927 eight textile-related industrial associations of this type had been formed for the purpose of joint sizing, processing, warehousing, purchasing, marketing and inspection.

As reviewed above, in the 1920s the industry took the initiative to carry out joint business activities, contributing to its modernization and rationalization. Accordingly, we believe similar results will be achieved by small and medium weaving sector enterprises in Pakistan through the "collaboration fund lending programme" proposed here.

B. Lending system (A suggestion)

1) Conduit institutions

The Industrial Development Bank of Pakistan (IDBP) and government-affiliated commercial banks should be made windows for lending.

2) Concept of the Scheme

The system would lend the following funds to small and medium-sized enterprises to modernize and rationalize their businesses by forming cooperative business associations (*) and by moving their mills to industrial parks under the factory group formation plans worked out by these associations.

- Funds necessary for cooperative business associations to acquire land and construct buildings for the operations of association members.
- Funds necessary for members of cooperative business associations to acquire land or construct buildings to conduct their businesses

(*) Cooperative associations formed by small and medium enterprises with a view to securing fair opportunities for economic activities and to improving their economic position by conducting cooperative business in the spirit of mutual aid should be regarded as cooperative business associations. Cooperative business associations conduct the following activities in an effort to rationalize the operations of small and medium enterprises and improve their opportunities for business.

[1] Joint operations in production, processing, purchasing, marketing, transportation and storage
[2] Establishing welfare facilities, extending working loans to members and other activities necessary to improve the economic standing of members

3) Group formation plans

The group formation plans should meet the following conditions.

[1] Groupings should be made in accordance with the grouping plans drawn up by the cooperative business associations which are mainly comprised of small and medium enterprises.
[2] There should be at least 20 small and medium enterprises in a group.
[3] All group members should belong to the same or directly-related industries. If several cooperative associations belonging to the same or directly-related industries form a federation, the number of small and medium enterprises referred to in [2] above should be no less than 10 per association.
[4] Pertinent joint business activities should be conducted in industrial parks.
[5] Industrial parks should be located in areas suitable for the establishment of mills.
[6] Factory buildings should be sufficiently safe and durable.

4) Associations and enterprises qualified for loans

4-1) Associations qualified

Cooperative business associations should meet the following conditions:

[1] The associations should be composed of members belonging to the fabric manufacturing, knit products manufacturing, and processing industries and their ancillaries.
[2] At least two thirds of the members should be enterprises or individuals whose fixed assets amount to no more than 20 million rupees.

4-2) Enterprises qualified

Enterprises should be members of cooperative business associations that draw up group formation plans and small and medium enterprises who would set up mills or business establishments in an industrial park.

5) Facilities that qualify for loans

Facilities qualified for loans should meet the requirements below and be one of those that are necessary for the implementation of the group formation plans. In principle, land should be acquired or construction work started within the same fiscal year that the loan is made.

[1] Land acquisition: In case cooperative business associations acquire land to create industrial parks, the cost of the acquisition.

[2] Joint facilities: Cost of constructing joint facilities such as buildings, including their machinery and equipment etc., set up by cooperative business associations in an effort to rationalize members' operations. (For example, joint facilities for production, processing, testing and research, inspection, storage, transportation, feeding and lodging, shopping areas, garages, water supply and draining systems, etc.)

[3] Factory buildings: In case the following factory buildings need to be constructed, the cost of construction.

(a) Factory buildings constructed by cooperative business associations for use by their members.

(b) Factory buildings constructed individually by association members.

6) Limit and ratio of lending

A limit should be set on the amount of loans for each facility. No limits should be set for joint facilities, however. The fixed limit multiplied by the lending ratio should become the amount of the loan. The limit on the amount of lending should determine the scope of the lending and should not obstruct further acquisition of land or construction of buildings.

[1] Fixed limit on scope of lending

[Item]	[Amount]	[Area]
Land	•Before creation: Up to X rupees per sq.m. •Already created: Up to X rupees per sq.m.	•Up to X sq.m. per enterprise (In case removal is made by the whole,up to double the size of the currently-owned site.)
Factory Building	•Cost of creation of land: Up to X rupees per sq.m. •Cost of construction: Up to X rupees per sq.m.	•Up to X sq.m.per enterprise (In case the removal is made by the whole, up to double the size of the currently-owned buildings.)
Joint facilities	(No limits)	(No limits)

[2] Lending ratio: 75 percent of necessary investment

7) Interest rate and terms of repayment

[1] Interest rate:

The interest rate of the loan should be fixed by taking the interest rate and commission of foreign loans, if any, and costs and margins of the executing financial institutions into consideration. It should not exceed 70 percent of the open market interest rate, however.

[2] Terms of repayment:

The repayment term should be about five years after a one-year grace period. Repayment should be made in yearly or half-yearly installments after the one year's grace.

8) Collateral/Credit guarantee

Lending institutions should require physical collateral or credit guarantee by a credit guarantee association (not yet established).

9) Procedure for applying for lending/examination and consultation

Loan applications should be submitted to the administrative unit in charge of the textile industry of the Ministry of Industries. After consulting with the section in charge of the government of the province where the planned industrial park is located, the unit in charge of the textile industry should examine the appropriateness of the plan, and, after offering guidance as the situation requires, authorize the loan. Financial institutions should make loans available to the applicants with the authorization of the Ministry of Industries.

10) Time of lending

Loans should be made only when contracts for the construction or installation of facilities have been concluded and payment of the sum excluding the amount of the loan has been settled.

11) Consulting organs

In advance of developing group formation plans, enterprises and business associations should consult the unit in charge of the textile industry of the Ministry of Industries, divisions and sections in charge of the provincial governments and the conduit financial institutions.

(3) Promotion of standardization for quality improvement of finished products

(3-1) Standardization of Inspection Programme

The overall technical level of Pakistan's textile industry remains quite low. Further, there is considerable difference between technical levels of individual firms, and attitudes to product quality of the small number of firms at the top level has nothing in common with the thinking concerning this aspect among firms at the lower end of technical competence. While upgrading of the technical level of individual firms is the basis for any overall upgrading, it is also important for the Government of Pakistan to carry out supporting activities and consider methods which will improve the overall national level of product quality, bearing in mind current international evaluations of Pakistan's textile products so as to identify ways to improve the international rating given to its textile exports. One approach is to reorganize the existing institutes and bodies concerned with standardization and quality control, and if their activities can be linked with those of related industries in a coordinated system, then it would be possible to undertake much more active and vigorous action for the diffusion of standardization and upgrading of quality levels. The invitation of foreign experts to give guidance on the achievements and expertise of the developed countries would provide an effective support to measures for standardization of inspection methods and compilation of uniform evaluation results for products.

On the basis of the above thinking the following activities for diffusion of standardization and inspection methods are to be furthered.

A. Objectives

To establish standards necessary for quality evaluation of textile products, and diffuse inspection methods suited to these standards throughout the textile industry. To clarify the problem points hindering the quality improvement and upgrading of Pakistan's textile products by compiling uniform government level data on the quality levels of export items. To promote exports through improved quality consciousness.

B. Details

To determine and diffuse the inspection procedures of products and grasp quality of textile products by means of uniform inspection. This is to be carried out through the following uniform measures:

- Establishment of criteria of the inspection methods used to apply standards
- Elaboration of uniform inspection methods for practise and improvement of inspection technology
- Comparative evaluation of the product quality of individual firms using the uniform inspection methods elaborated.

Also concurrently with the above measures evaluation of export markets and comparisons with products of competitor countries is to be carried out to clarify points for improvement of product quality and help the

setting of product quality targets.

B-1. Implementing Body

The central driving force for the project is to be the Pakistan Standards Institution (PSI). If the planned merger of PSI with the Central Testing Laboratories (CTL) is effected to establish a Pakistan Standards and Quality Control Authority (PSQCA) then this organization could carry out implementation.

B-2. Action Programme

- Creation of Criteria for Inspection Methods

Relating to standardization of textiles, PSI has already set 403 standards. These standards are largely according to the British Standards. Also the number of firms which have installed new inspection devices is increasing as the importance of product quality is gaining more recognition. Such firms are especially numerous in the spinning sector, but are limited to a section of the weaving and dyeing-finishing sector firms. In order to grasp how Pakistan's textile products are rated by users both at home and abroad it is important to have inspection results concerning the result of warping (or classimat inspection results), and grey cloth and dyed fabric. However, such results are not generally accorded importance and are not usually carried out. Moreover, little testing of the fastness of dyed fabrics (washing and sunlight fastness) is carried out. It is necessary to emphasize the application of such methods of evaluating the serviceability in order to further the improvement and upgrading of product quality. The application of methods which are outside the range of established standards but which are widely implemented internationally should also be carried out and industrial standards set up in cooperation with the textile industry.

- Standardization of Actual Inspection Methods and Upgrading of Inspection Technology

In order to carry out actual inspections, training of inspection personnel in the handling of inspection devices, the making of samples, the setting of evaluation criteria, etc. will be necessary. At present instruction is received from the manufacturers of inspection devices and technical guidance is provided by overseas customers. Further training in inspection methods is carried out through the training course in quality control given at the TIRDC. In order to obtain uniform evaluation results on a national level it is important to ensure that a given sample or product will give the same results irrespective of who carries out the inspection or where it is done. If differing inspection procedures or evaluation criteria are employed depending on who carries out an inspection then mistakes may arise when claims arise against a given product, and it will be impossible to adopt the necessary countermeasures.

In order to standardize the inspection methods and technology used in the various institutes and factories, inspectors of the various inspecting boards and bodies need to be gathered together and inspection technology coordinated through the present programme. The cooperation of PSQCA (that is PSI and CTL) and TIRDC

will be needed to effect, and regular comparisons of inspection methods and technology will need to be carried out.

- Comparative Evaluation of Product Quality of Individual Firms using Uniform Inspection Methods

Just setting standards in itself will not result in any upgrading of product quality. Nor will inspection of products alone necessarily entail any upgrading of product quality levels. When setting targets for upgrading of product quality, it is important for a firm to have comprehensive information concerning the evaluation and position accorded to its products through unified criteria, both domestically and overseas. From the national point of view it is essential to secure an evaluation of the quality of the products of all individual firms on a uniform basis in order that the government takes measures on Pakistan products quality level. PSQCA, working in cooperation with industrial organizations, should regularly evaluate product quality of the various firms simultaneously. Of course care should be taken to avoid publication of individual company names in connection with the evaluation results, but guidelines concerning the improvement targets decided upon should be fed back to the individual firms. It would be possible to commission the implementation of inspections to a neutral inspection board independent from the various industrial organizations rather than having inspections carried out by a government body which could simply have a checking function. Although there may be some reluctance or hindrance encountered concerning actual implementation of such inspection, it is important to gain the understanding and cooperation of industrial organizations and individual firms since these activities to diffuse standardization will help to upgrade the international evaluation of the country's textile products.

B-3. Inspection Equipment and Personnel

The equipment and personnel of PSQCA (or CTL) or of TIRDC are to be employed for inspection purposes. At present modernization of the inspection equipment and technical guidance is being undertaken at CTL with support from the United Nations (UNIDO). TIRDC also possesses relatively modern equipment for evaluating finished products and capable inspecting personnel. Personnel responsible for planning and implementation of the overall programme could be attached to PSQCA (or PSI) and the above-mentioned equipment and personnel be employed for diffusion of actual inspection activities.

B-4. Invitation of Overseas Experts

In order to standardize the inspection methods of public institutes and of private companies it will be necessary to develop the technical and instructional expertise of the staff drawing up the implementation plan for the programme and of the inspectors who will carry this out. To this end the invitation of foreign experts to provide guidance is considered an effective way of assimilating the experience and know-how of the developed nations.

The overseas experts with functiuons as follows are to be invited:

To draw up a uniform inspection system and to plan diffusion of it;

To standardize inspection methods; and
To provide guidance in inspection technology

B-5. Costs

The government will meet the personnel costs for the staff in charge of the envisaged programme. Inspection and other costs etc. involved in the actual standardization of inspection methods, and the costs incurred to prepare the documents of evaluation results for distribution are to be met by the industry itself. A settled amount of the government subsidy may be considered to meet the costs of maintenance and replacement of inspection equipment.

C. Organizational Framework

The existing organizations of PSI and CTL (or of PSQCA) are to be employed. The textile policy unit of MOI is to be put in charge of the promoting and monitoring of the programme. The main implementing body is to be PSI (or PSQCA).

D. Schedule

It is anticipated that about three years from decision to implement the programme up to the functioning of its major activities will be required, provided that the preparatory work (including clarification of objectives and provision of an organizational framework noted in Section E below) is begun promptly.

E. Preconditions of Programme Implementation

The vigorous leadership of the Government and cooperation of related industrial sectors are essential to the progress and realization of the present programme. To ensure these, clarification of the programme objectives and provision of an organizational framework are required.

It is necessary to make the main objectives of this programme quite specific by means of collecting and analysing data and information concerning the international evaluation of Pakistan's textile products, and obtaining a clear vision of the present position and placement of Pakistan's textile products.

The guidelines for industry relating to standardization and inspection systems should be established, and governmental bodies such as PSI, CTL (or PSQCA), TIRDC,etc. should be furnished with the organizational framework for the programme.

2-3-2. Evaluation of Programme Priorities

(1) Criteria for evaluating priorities

Programme priorities are to be evaluated in terms of their benefits and effectiveness, and encountering problems which must be overcome in implementation, as follows;

A. Contribution to Attaining the Envisaged Objectives (Objective benefit and effectiveness)

The appropriateness of a given priority is measured by the extent to which this is expected to favour or effectively promote an objective. Priorities which will make the greatest contribution are to be given precedence in the programme. In view of the objectives of the present survey, contribution to the following aspects are to be considered.

a. Effectiveness in Improving Technology

Comparative evaluation in terms of the degree effectiveness in improving the quality of products, in upgrading technical levels, or in improving productivity.

b. Effectiveness in Promoting Exports

Comparative evaluation in terms of the degree of effectiveness in promoting exports and securing foreign exchange.

c. Effectiveness in Reinforcing the Industrial Base

Comparative evaluation in terms of the contribution to the balanced overall development of the industry through resolution of structural bottlenecks in the industry or reinforcement of individual firm's structure, etc.

d. Indirect Benefits to the Economy or Society

Evaluation of the effectiveness in providing indirect benefits to the economy or society, for example an expansion of the national economy, expansion of employment opportunities, development of working places for women, etc.

B. Problems facing Programme Implementation needing Consideration

The existence, degree and difficulty of problems which may be encountered in the programme implementation must be considered and the programme with the minimum of problems offering the line of least difficulty should be chosen. The following outlines the types of problem which may be encountered.

a. Social and Environmental Problems

It will be necessary to evaluate whether there is any problem of compatibility of the programme with the existing social customs and legal system of Pakistan. Also compatibility with other national government programmes needs to be assessed.

b. Financial Problems

An evaluation to ascertain whether there are any problems relating to the size and distribution of cost burdens, to feasibility of expenditure configurations, etc.

c. Organizational Problems

Evaluation of problems relating to the selection of implementing and managing bodies, the establishment of their organizational systems, the recruitment of personnel, etc.

d. Timing Problems

A comparison of the possibility of a prompt handling of works, and of the length of time involved from operational commencement to the realization of concrete effects and benefits.

(2) Evaluation of Programme Priorities

Table VI-2-3 summarizes the results of an evaluation of priorities for the promotion programme carried out using the above criteria.

(3) Implementation Schedule

As reference, Table VI-2-4 indicates an outline of an implementation schedule for the programme taking account of the results of the evaluation of the programme priorities. If considerable time is needed before a programme can be implemented, then it will be necessary to undertake a certain extent of review at the time of the programme initiation to take account of any contextual changes in overseas and domestic markets, the raw material situation, etc. and to accommodate changes in the national economy, industrial policy or industrial trends which may have arisen in the meantime.

Table VI-2-3 PROGRAMME PRIORITIES

Programme	A. Contribution to Attaining the Envisaged Objectives				B. Problems facing Programme Implementation needing Consideration				Priority
	Effectiveness in Improving Technology	Effectiveness in Promoting Exports	Effectiveness in Reinforcing the Industrial Base	Indirect Benefits to the Economy or Society	Social and Environmental Problems	Financial Problems	Organizational Problems	Timing Problems	
(1-1) Technical Upgrading Supporting Programme for Textile Up- & Mid- stream Sectors	A	B	B	B	A	B	B	B	5
(1-2) Technical Upgrading Supporting Programme for Small & Medium Scale Textile Industries in Punjab Area	A	A	B	B	A	A	A	A	2
(1-3) Technical Upgrading Supporting Programme for Garment Sector	A	A	B	A	A	B	B	B	1
(2-1) Financing Scheme for Modernization of Textile Industry	B	B	A	A	A	C	B	B	3
(2-2) Financing Scheme for Groupings in Textile Industry	B	B	A	A	A	C	B	B	3
(3) Standardization of Inspection Programme	B	B	B	B	A	A	A	A	6

Table VI-2-4 IMPLEMENTATION SCHEDULE OF PROGRAMME

Programme		1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year
(1-1) Technical Upgrading Supporting Programme for Textile Up- & Mid-stream Sectors	Stuff Recruitwent, Training Building Design, Construction Equipment Procurement, Installation			Preparation	and Planning				
(1-2) Technical Upgrading Supporting Programme for Small & Medium Scale Textile Industries in Punjab Area	Stuff Recruitment, Training Building Design, Construction Equipment Procurement, Installation		Preparation	and Planning					
(1-3) Technical Upgrading Supporting Programme for Garment Sector	Stuff Recruitment, Training Building Design, Construction Equipment Procurement, Installation	Preparation	and Planning						
(2-1) Financing Scheme for Modernization of Textile Industry	Requirement Survey of Financing Fund Source, Loan Preparation Financing Service	Preparation	and Planning						
(2-2) Financing Scheme for Groupings in Textile Industry	Requirement Survey of Financing Fund Source, Loan Preparation Financing Service	Preparation	and Planning						
(3) Standardization of Inspection Programme	Establishing Inspection Standard Diffusing Inspection Method Comperative Evaluation of Product Quality			Preparation	and Planning				

APPENDIX TABLES

Table II-2-1 World Textile Fibre Production

(1,000 Tons)

	Manmade Fibre			Natural Fibre				
	Synthetic	Rayon/ Acetate	Total Manmade	Cotton	Wool	Silk	Total Natural	Total Fibre
1950	69	1,612	1,681	6,647	1,057	19	7,723	9,404
1960	702	2,608	3,310	10,113	1,463	31	11,607	14,916
1970	4,700	3,436	8,136	11,782	1,602	41	13,425	21,561
1980	10,476	3,242	13,718	13,991	1,607	56	15,654	29,372
1990	14,869	2,846	17,715	18,714	1,964	66	20,744	38,459
Share (%):								
1950	0.7	17.1	17.9	70.7	11.2	0.2	82.1	100
1960	4.7	17.5	22.2	67.8	9.8	0.2	77.8	100
1970	21.8	15.9	37.7	54.6	7.4	0.2	62.3	100
1980	35.7	11.0	46.7	47.6	5.5	0.2	53.3	100
1990	38.7	7.4	46.1	48.7	5.1	0.2	53.9	100
Average Annual Growth Rate (%):								
1950-60	26.1	4.9	7.0	4.3	3.3	5.0	4.2	4.7
1960-70	20.9	2.8	9.4	1.5	0.9	2.8	1.5	3.8
1970-80	8.3	-0.6	5.4	1.7	0.03	3.2	1.5	3.1
1980-90	3.6	-1.3	2.6	2.9	2.0	1.7	2.9	2.7

<Note> Formula of average annual growth rate: $X_n = X_o (1 + r)^2$

(Source) SEN-I SOGO KENKYUSHO: "Textile Handbook 1992" (p.167)
(Original Data from "Fiber Organon")

Table II-2-2 Network of World Trade of Textiles & Clothing

(Unit: US$ Billion)

(A-1) TEXTILES 1980 EXPORT

Destination → / ↓Origin	Developed Countriess	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	28.25	8.45	2.40	39.10
Developing Economies	6.05	5.30	0.90	12.25
Eastern Trading Area	1.75	1.75	1.00	4.50
WORLD	36.05	15.50	4.30	55.85

(A-2) TEXTILES 1988 EXPORT

Destination → / ↓Origin	Developed Countriess	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	43.05	9.25	2.25	54.55
Developing Economies	10.60	11.05	4.35	26.00
Eastern Trading Area	3.50	6.95	1.85	12.30
WORLD	57.15	27.25	8.45	92.85

(B-1) CLOTHING 1980 EXPORT

Destination → / ↓Origin	Developed Countriess	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	17.30	2.15	0.70	20.15
Developing Economies	12.90	2.55	0.20	15.65
Eastern Trading Area	2.05	0.70	2.35	5.10
WORLD	32.25	5.40	3.25	40.90

(B-2) CLOTHING 1988 EXPORT

Destination → / ↓Origin	Developed Countriess	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	32.85	2.80	0.70	36.35
Developing Economies	36.00	3.75	0.85	40.60
Eastern Trading Area	6.80	2.25	3.45	12.50
WORLD	75.65	8.80	5.00	89.45

(Source) GATT: "International Trade 89-90", Vol. II

Table II-2-3 Ratio of Contribution to the Increase/Decrease of Textile Trade

TEXTILES 1980-1988 (Unit: %)

Importers→ / ↓Exporters	Developed Countries	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	40.0	2.2	-0.4	41.8
Developing Economies	12.3	15.5	9.3	37.1
Eastern Trading Area	4.7	14.1	2.3	21.1
WORLD	57.0	31.8	11.2	100.0

CLOTHING 1980-88 (Unit: %)

Importers→ / ↓Exporters	Developed Countries	Developing Economies	Eastern Trading Area	WORLD
Developed Countries	32.0	1.3	0.0	33.4
Developing Economies	47.6	2.5	1.3	51.4
Eastern Trading Area	9.8	3.2	2.3	15.2
WORLD	89.4	7.0	3.6	100.0

(Source) GATT: "International Trade 89-90", Vol. II

Table II-3-1 GDP composition by sectors
(At constant factor cost)
(Unit: Million Rupees)

	1989/90	% Share	1980/81	% Share
Agriculture	108,820	25.7	76,399	30.8
Minning & Querrying	2,263	0.5	1,053	0.4
Manufacturing	**74,309**	**17.6**	**37,446**	**15.1**
Construction	17,466	4.1	11,586	4.7
Trade & Service	219,792	52.0	121,347	49.0
GDP (Factor cost)	**422,650**	**100**	**247,831**	**100**

<Notes > At constant factor cost of 80/81 price
(Source) Federal Bureau of Statistics: "*Pakistan Statistical Year-book 1990*" (P.460/461)
(16.2 Gross National Product at constant factor cost of 1980/81)

Table II-3-2 Census value added by industriral sub-sectors
(Unit: Million Rupees)

	1985/86	% Share	1980/81	% Share
Food, Beverage, Tobacco	16,593	30.0	10,101	35.2
☆Textile & textile products	**10,368**	**18.7**	**5,590**	**19.5**
Cotton & cotton ginning	1,147	2.1	764	2.7
Textiles	8,596	15.5	4,571	15.9
Wearing apparel	625	1.1	255	0.9
Machineries	4,661	8.4	2,279	7.9
Petroleum refining	3,914	7.1	1,972	6.9
Non-metalic mineral products	3,597	6.5	1,697	5.9
Metal products	2,674	4.8	1,459	5.1
Leather & Leather products	1,062	1.9	533	1.9
ALL INDSUTRIES	**55,298**	**100**	**28,696**	**100**

(Source) Federal Bureau of Statistics: "*Pakistan Statistical Year-book 1990*" (P.190/191)
(5.6 Census Value Added by major groups of industry)

Table II-3-3 Structure of exports by major categories (1989/90)

SITC (R3)	Commodities	Value (Rps. Million)	Value* (US$ Mill)	Share (%)
	GRAND TOTAL	106,469.3	5,047.7	100
0, 1	Food, Live Animals, Beverages & Tobacco	10,532.3		9.9
2,3,4	Crude Matl, Mineral Fuels, Oth Oil & Wax	13,951.1		13.1
5	Chemical & Related Prdcts nes.	592.7		0.5
6	Manufactured Goods by Material	56,980.6		53.5
[65	TEXTILE YARN, FABRICS, ETC	50,020.3	2,371.5	47.0]
	Textile Yarn & Thread	18,289.3	867.1	17.2
	Woven Fabrics	17,592.1	834.0	16.5
	Textile made-ups, Carpets etc.	14,138.9	670.3	13.3
7	Machinery & Transport Equipment	369.0		0.4
8	Misc Manufactured Articles	23,769.6		22.3
[84	APPAREL & CLOTHING ACCESSORIES	18,531.8	878.6	17.4]
9	Commodities nes.	273.9		0.3
[65+84	TEXTILE YARN, FABRICS, APPAREL: TOTAL	68,552.1	3,250.1	64.4]
	Total industrial manufactured products:	81,985.8	3,887.0	100
	Textile and textile products	68,552.1	3,250.1	83.6

* Conversion rate: @ 21.0925

(Source) Federal Bureau of Statistics: *"Foreign Trade Statistics, Exports & Re-exports, 1989/90"*

Table II-3-4 Installed Capacity and Capacity Utilization in Spinning Sector

(Unit: 1,000)

	No. of Units	Installed		Worked		Utilization (%)	
		SPINDLES	ROTORS	SPINDLES	ROTORS	SPINDLES	ROTORS
1971/72	131	2,848	0	2,650	0	93.0	-
1972/73	150	3,226	0	3,057	0	94.8	-
1973/74	155	3,308	0	3,034	0	91.7	-
1974/75	143	3,110	0	2,823	0	90.8	-
1975/76	127	3,478	1	2,579	1	74.2	100.0
1976/77	135	3,544	1	2,650	1	74.8	100.0
1977/78	140	3,560	4	2,680	2	75.3	50.0
1978/79	152	3,704	14	2,772	9	74.8	64.3
1979/80	149	3,731	16	2,841	15	76.1	93.8
1980/81	158	3,983	19	3,175	16	79.7	84.2
1981/82	155	4,180	23	2,943	22	70.4	95.7
1982/83	215	4,313	27	2,986	25	69.2	92.6
1983/84	216	4,272	29	2,919	23	68.3	79.3
1984/85	220	4,445	29	2,872	21	64.6	72.4
1985/86	227	4,485	37	3,151	25	70.2	67.6
1986/87	226	4,355	48	3,469	40	79.6	83.3
1987/88	224	4,393	55	3,607	46	82.1	83.6
1988/89	247	4,853	66	4,026	60	82.9	90.9
1989/90	266	5,271	72	4,489	64	85.2	88.9
1990/91*	277	5,582	74	4,803	68	86.0	91.9

* Provisional

(Source) APTMA: *"Chairman's Review 1991" and additional papers*

Table II-3-5 Installed Capacity and Capacity Utilization in Weaving Sector (Mill Sector only)

(Unit: 1,000)

	Installed		Worked		Utilization (%)	
	LOOMS	SHUTLES LOOMS	LOOMS	SHUTLES LOOMS	LOOMS	SHUTLES LOOMS
1971/72	30	0	26	0	86.7	-
1972/73	29	0	27	0	93.1	-
1973/74	29	0	26	0	89.6	-
1974/75	29	0	25	0	86.2	-
1975/76	29	0	23	0	79.3	-
1976/77	29	0	19	0	65.5	-
1977/78	26	0	15	0	57.7	-
1978/79	27	0	14	0	51.8	-
1979/80	26	0	16	0	61.5	-
1980/81	25	0	13	0	52.0	-
1981/82	24	0	14	0	58.3	-
1982/83	24	0	12	0	50.0	-
1983/84	24	0	11	0	45.8	-
1985/85	23	0	10	0	43.5	-
1985/86	19	0	9	0	47.4	-
1986/87	17	0	8	0	47.0	-
1987/88	16	N.A.	9	N.A.	56.2	N.A.
1988/89	16	N.A.	9	N.A.	56.2	N.A.
1989/90	16	1,191	8	1,080	50.0	90.7
1990/91*	15	1,191	7	1,080	46.7	90.7

* Provisional

(Source) APTMA: *"Chairman's Review 1991" and additional papers*

Table II-3-6 Spinning Capacity and Production of Cotton Yarn

	No. of Units	Installed SPINDLES (1,000)	Installed ROTORS (1,000)	Total of SPINDLES & ROTERS (1,000)	Total of SPINDLES & ROTERS (Index)	YARN PRODUCTION (1,000Ton)	YARN PRODUCTION (Index)
1971/72	131	2,848	0	2,848	100.0	335.7	100.0
1972/73	150	3,226	0	3,226	113.3	376.1	112.0
1973/74	155	3,308	0	3,308	116.2	379.5	113.0
1974/75	143	3,110	0	3,110	109.2	351.2	104.6
1975/76	127	3,478	1	3,479	122.2	349.7	104.2
1976/77	135	3,544	1	3,545	124.5	282.6	84.2
1977/78	140	3,560	4	3,564	125.1	297.9	88.7
1978/79	152	3,704	14	3,718	130.5	327.8	97.6
1979/80	149	3,731	16	3,747	131.6	362.9	108.1
1980/81	158	3,983	19	4,002	140.5	374.9	111.7
1981/82	155	4,180	23	4,203	147.6	430.2	128.2
1982/83	215	4,313	27	4,340	152.4	448.4	133.6
1983/84	216	4,272	29	4,301	151.0	432.6	128.9
1984/85	220	4,445	29	4,474	157.1	431.7	128.6
1985/86	227	4,485	37	4,522	158.8	482.2	143.6
1986/87	226	4,355	48	4,403	154.6	586.4	174.7
1987/88	224	4,393	55	4,448	156.2	685.0	204.1
1988/89	247	4,853	66	4,919	172.7	767.4	228.6
1989/90	266	5,271	72	5,343	187.6	925.4	275.7
1990/91*	277	5,582	74	5,656	198.6	1,056.1	314.6

* Provisional

(Source) APTMA: *"Chairman's Review 1991"* (P.44)

Data for 1990/91 is derived from an additional paper of APTMA

Fig. II-3-7 Production of Cotton Yarn: Count-wise & Category-wise

(Unit: Qty 1,000 Tons)

Period	Cotton Yarn				Cotton Yarn			
	Coarse Count 1-20	Medium Count 21-34	Fine Count 35-47	S.Fine Count 48-80	Sub-Total	Mixed and Hard Waste	Manmade (P/V, P/C)	TOTAL
1981/82	185.6	165.9	18.1	8.3	377.9	19.4	32.8	430.2
(%)	(49.1)	(43.9)	(4.8)	(2.3)	(100)			
(%)					(87.8)	(4.5)	(7.6)	(100)
1982/83	191.7	182.5	20.1	11.2	405.5	9.5	33.3	448.4
(%)					(90.4)	(2.1)	(7.4)	(100)
1983/84	164.3	179.5	19.8	15.5	379.1	9.4	44.0	432.6
(%)	(43.3)	(47.3)	(5.2)	(4.1)	(100)			
(%)					(87.6)	(2.2)	(10.2)	(100)
1984/85	164.6	191.7	21.4	12.7	390.4	8.4	33.0	431.7
(%)					(90.5)	(1.9)	(7.6)	(100)
1985/86	146.9	238.1	28.5	15.5	429.0	7.9	45.2	482.2
(%)	(34.2)	(55.5)	(6.6)	(3.6)	(100)			
(%)					(89.0)	(1.6)	(9.4)	(100)
1986/87	224.5	262.3	29.2	13.6	529.6	9.6	47.2	586.4
(%)					(90.4)	(1.6)	(8.0)	(100)
1987/88	249.7	311.6	29.3	17.1	607.7	10.2	67.2	685.0
(%)	(41.1)	(51.3)	(4.8)	(2.8)	(100)			
(%)					(88.7)	(1.5)	(9.8)	(100)
1988/89	275.3	349.0	14.9	11.2	650.4	13.4	103.6	767.4
(%)					(84.8)	(1.7)	(13.5)	(100)
1989/90	351.3	412.1	16.3	7.7	787.5	14.2	123.7	925.4
(%)	(44.6)	(52.3)	(2.19	(1.0)	(100)			
(%)					(85.1)	(1.5)	(13.4)	(100)
1990/91*	310.3	328.2	12.3	6.3	657.0	11.7	111.7	780.4
(Jul/Mar)	(47.2)	(50.0)	(1.9)	(1.0)	(100)			
(%)					(84.2)	(1.5)	(14.3)	(100)

<Note> * Provisional

Man-made fiber yarn: about 26% is Poly/Viscos and 74% is Poly/Cotton in 1989/90

(Source) APTMA: "Chairman's Review 1991" (P.46)

Table II-3-8 Weaving Capacity and Production of Cloth

Mill Sector only

	No. of Installed Looms				Total Cloth Production	
	Looms (1,000)	Shutleless (1,000)	Total Looms (1,000)	(Index)	(Mill. Sq. M.)	(Index)
1971/72	30	0	30	100.0	628.2	100.0
1972/73	29	0	29	96.7	589.2	93.8
1973/74	29	0	29	96.7	592.2	94.3
1974/75	29	0	29	96.7	555.9	88.5
1975/76	29	0	29	96.7	520.3	82.8
1976/77	29	0	29	96.7	408.3	65.0
1977/78	26	0	26	86.7	391.3	62.3
1978/79	27	0	27	90.0	339.4	54.0
1979/80	26	0	26	86.7	342.3	54.5
1980/81	25	0	25	83.3	307.9	49.0
1981/82	24	0	24	80.0	325.0	51.7
1982/83	24	0	24	80.0	335.5	53.4
1983/84	24	0	24	80.0	296.6	47.2
1984/85	23	0	23	76.7	271.8	43.3
1985/86	19	0	19	63.3	253.5	40.4
1986/87	17	0	17	56.7	238.2	37.9
1987/88	16	n.a.	16	53.3	281.6	44.8
1988/89	16	n.a.	16	53.3	269.9	43.0
1989/90	16	1.2	17	56.7	294.8	46.9
1990/91	15	1.2	16	53.3	292.9	46.6

(Source) APTMA: *"Chairman's Review 1991"* (P.44)

Data for 1990/91 is derived from an additional paper of APTMA

Table II-3-9 Production of Cotton Cloth: Category-wise and Sector-wise

(Qty Unit: Mill. Sq. Mtrs)

Period	Mill Sector					Non-mill Sector	G.TOTAL
	Grey Cloth	Bleach -ed	Dyed & Printed	Blended	SUB-TOTAL		
1980/81	194.3	35.3	50.0	28.3	307.9	1526.1	1834.0
(%Share)	(63.1)	(11.5)	(16.2)	(9.2)	(100)		
(%Share)					(16.8)	(83.2)	(100)
1981/82	196.4	33.5	54.2	40.9	325.0	1875.4	2200.4
1982/83	175.8	53.6	67.7	38.4	335.5	1713.2	2048.8
1983/84	152.5	47.8	59.7	36.6	296.6	1847.6	2144.2
1984/85	148.7	39.4	54.9	28.9	271.8	1727.1	1998.9
(%Share)	(54.7)	(14.5)	(20.2)	(10.6)	(100)		
(%Share)					(13.6)	(86.4)	(100)
1985/86	142.9	29.6	49.1	31.9	253.5	1732.5	1986.0
1986/87	116.0	23.4	44.8	54.1	238.2	1771.7	2010.0
1987/88	142.4	20.9	57.2	61.1	281.6	1948.9	2230.5
1988/89	147.7	19.1	53.9	49.2	269.9	1980.1	2250.0
(%Share)	(54.7)	(7.1)	(20.0)	(18.2)	(100)		
(%Share)					(12.0)	(88.0)	(100)
1989/90	174.6	19.4	53.6	47.2	294.8	2440.0	2734.8
(%Share)	(59.2)	(6.6)	(18.2)	(16.0)	(100)		
					(11.0)	(89.0)	(100)
1990/91	124.5	12.2	42.2	43.5	222.4	n.a.	n.a.
(Jul-Mar)	(56.0)	(5.5)	(19.0)	(19.6)	(100)		
1990/91*	n.a.	n.a.	n.a.	n.a.	292.9	2561.1	2854.0
					(10.3)	(89.7)	(100)

* Information from TCO

(Source) TIRDC: *'Pakistan Textiles Statistics'* (P.28)

APTMA: *'Chairman's Review 1991'* (P.47) (Original Data from TCO)

Table II-3-10 Export Structure of Textile Products (1989/90)

SITC CODE	Product Items	VALUE (R.1000)	SHARE (%)	
65	TEXTILE PRODUCTS	50020295	73%	
84	ARTICLES APPAREL & CLOTHING ACCES	18531831	27%	
	65+84 TOTAL TEXTILE PRODUCTS	68552126	100%	
651	YARN & THREAD	18289289	26.7	100%
	651-1 Yarn, Wool	6434		0.0
	651-2,3 Yarn & Thread, Cotton	17982081		98.3
	651-4,5,7,8 Yarn & Thread, Manmade	297800		1.6
	651-9 Yarn, Tex Fib, NES.	2975		0.0
652-4	WOVEN FABRIC	16560892	24.2	100%
652	Woven Fab, Cotton & >85%-Mix	11999732		72.5
653	Woven Fab, Synth & Mix	4555910		27.5
654	Woven Fab, Silk & Wool	5250		0.0
655	KNITTED FAB	470725	0.7	
656-9	OTHER WOVEN FAB & TEX PRODUCTS	14699390	21.4	100%
656	Ribbons, Laces, etc.	114345		0.8
657	Special Yarn Textile Fab & Prod	446138		3.0
658	Made-up Articles, NES	9215421		62.7
659	Floor Coverings, etc	4923486		33.5
841-5	APPAREL	13084056	19.1	100%
841	Men/Boy Coat, Suits, etc, Fabrics	4505005		34.4
842	Women Coat etc, Fabrics	2084196		15.9
843	Men/Boy Coat, etc, Knit	2991214		22.9
844	Women Coat etc, Knit	1364399		10.4
845	Apparel, Fab & Knit, NES	2139242		16.3
846	Clothing Accessories, Text Fab	1209906	1.8	
848	Apparels, Cloth Accessories, Not Text	4237869	6.2	

<Note> *"846: Clothing Accessories, Textile Fabrics"*, *"848: Apparel, Clothing Accessaries, Not Textile"* should be excluded from "Garments", but they were included here in order to check the structure of export.

(Source) Federal Bureau of Statistics: *"Foreign Trade Statistics of Pakistan; Exports & Re-exports, 1990"*

Table II-3-11 Export Share of Cotton Fabrics by Types (1989/90)

		(1,000 Sq.M.)	(Rs.Million)	(%SHARE)
652	COTT FAB, PURE & >85%-MIX	1,017,872	11,999.7	100%
652-1	Towel	24,230	276.9	2.3
652-2	Cott Fab, Unbleached	547,179	5,751.8	47.9
652-3,4	Cott Fab, Bleached & Dyed	412,335	5,605.7	46.7
652-5,6	Cott Fab, Manmade Mix	2,079	18.9	0.2
652-9	Other Cott Fab	32,055	346.3	2.9

(Source) Federal Bureau of Statistics: *"Foreign Trade Statistics of Pakistan; Exports & Re-exports, 1990"*

Table II-3-12 Export Share of Garments by Materials & Categories (1989/90)

SITC Codes	Descriptions	VALUE (R.1000)	SHARE (%)
841-845:	READYMADE GARMENTS	13,084,056	(100%)
	OF COTTON	11,201,678	85.6
	OF SYNTHETIC	1,374,381	10.5
	OF WOOL	68,761	0.5
	OF OTHER TEXTILE	439,236	3.4
841	MEN/BOY COAT, SUITS, ETC, FABRIC	4,505,005	(100%)
	OF COTTON FAB	3,750,781	83.3
	OF SYNTHETIC FAB	595,561	13.2
	OF WOOL	539	0.0
842	WOMEN COAT ETC, FABRIC	2,084,196	(100%)
	OF COTTON FAB	1,686,128	80.9
	OF SYNTHETIC FAB	327,364	15.7
	OF WOOL	25,319	1.2
843	MEN/BOY COAT, ETC, KNIT	2,991,214	(100%)
	OF COTTON FAB, KNIT		
	OF SYNTHETIC FAB, KNIT	88,623	3.0
	OF WOOL FAB, KNIT	41,482	1.4
844	WOMEN COAT ETC, KNIT	1,364,399	(100%)
	OF COTTON FAB, KNIT	1,288,330	94.4
	OF SYNTHETIC FAB, KNIT	48,467	3.6
	OF WOOL FAB, KNIT	1,421	0.1
845	APPAREL, FAB & KNIT	2,139,242	(100%)
	OF COTTON, NES	1,628,287	76.1
	OF SYNTHETIC, NES	314,366	14.7

(Source) Federal Bureau of Statistics:
"Foreign Trade Statistics of Pakistan, Exports and Re-exports, 1990"

Table II-3-13

Cotton Yarn: Area-wise Export Share (1989/90)

6513: Cotton Yarn

Destination	Value (R.1000)	Share (%)
WORLD	17,916,685	100%
ASIA	13,399,840	74.8
Japan	5,967,821	33.3
Hong Kong	2,508,080	14.0
South Korea	1,905,435	10.6
Singapore	317,383	1.8
Thailand	306,118	1.7
Indonesia	230,462	1.3
EUROPE, WEST	2,339,846	13.1
Sweden	429,155	2.4
Finland	406,576	2.3
Germany, Fed	285,182	1.6
Greece	219,483	1.2
EUROPE, EAST	810,410	4.5
Bulgaria	615,887	3.4
MIDDLE EAST	792,012	4.4
Turkey	649,086	3.6
AFRICA	265,510	1.5
NORTH AMERICA	209,626	1.2
OCEANIA	72,514	0.4
LATIN AMERICAS	23,271	0.1

Table II-3-14

Cotton Fabric: Area-wise Export Share (1989/90)

6522/23: Cotton Woven Fabric, Unbleached & >85% Cotton, Bleached

Destination	Value (R.1000)	Share (%)
WORLD	11,122,284	100%
EUROPE,WEST	3,253,445	29.3
U.K.	1,201,472	10.8
Sweden	425,412	3.8
Germany, Fed	365,483	3.3
ASIA	3,131,642	28.2
Japan	569,682	5.1
Bangladesh	531,734	4.8
South Korea	383,432	3.4
Singapore	279,914	2.5
Hong Kong	267,589	2.4
NORTH AMERICA	1,324,562	11.9
U S A	1,099,453	9.9
AFRICA	1,255,129	11.3
MIDDLE EAST	1,053,236	9.5
Dubai	321,103	2.9
OCEANIA	667,523	6.0
Australia	612,843	5.5
EUROPE, EAST	406,436	3.6
U S S R	283,293	2.5
LATIN AMARICAS	29,186	0.3

(Source) Federal Bureau of Statistics:
'Foreign Trade Statistics of Pakistan, Exports & Re-exports, 1990'

Table II-3-15 Garments: Trend of Area-wise Export Share

Year	1985/86		1986/87		1987/88		1988/89		1989/90	
Destination	(R. Mill)	(%)	(R. Mill)	(%)	(R. Mill)	(%)	(R. Mill)	(%)	(R. Mill)	(%)
WORLD	3,808.0	100	7,265.1	100	7,938.3	100	8,958.7	100	13,084.1	100
WEST EUROPE	1,268.1	33.3	2,356.9	32.4	2,962.5	37.2	3,453.3	38.5	5,793.7	44.3
Germany, Fed	455.1	12.0	960.7	13.2	1,180.9	14.9	1,438.0	16.1	2,136.3	16.3
U. K.	285.0	7.5	563.4	7.8	595.4	7.5	726.3	8.1	1,211.7	9.3
France	97.9	2.6	319.2	4.4	423.7	5.3	492.8	5.5	995.4	7.6
Netherland	266.4		172.5		275.3		287.4		514.5	
Belgium					76.6		79.2		245.5	
Italy			99.5		132.9		130.6		167.9	
Sweden	44.6		53.1		85.2		84.5		159.9	
NORTH AMERICA	1,277.5	33.5	2,292.1	31.6	3,096.3	39.0	4,164.0	46.5	5,485.6	41.9
U S A	1,114.1	29.3	2,080.0	28.6	2,714.2	34.2	3,730.4	41.6	4,808.5	36.8
Canada	163.5		212.2		382.1		433.6		676.4	
EAST EUROPE	622.2	16.3	1,066.8	14.7	1,066.8	13.4	894.1	10.0	1,133.9	8.7
U S S R	606.5	15.9	1,052.4	14.5	1,057.4	13.3	883.6	9.9	938.2	7.2
MIDDLE EAST	515.9	13.5	1,336.1	18.4	648.2	8.2	285.6	3.2	426.2	3.3
Saudi Arabia	285.3		924.8		366.6		115.2		205.4	
Dubai	194.9		384.8		245.0		131.3		142.0	
ASIA	11.4	0.3	36.9	0.5	34.9	0.4	48.4	0.5	103.6	0.8
OCEANIA	21.0	0.6	33.5	0.5	29.9	0.4	59.9	0.7	71.6	0.5
AFRICA	91.0	2.4	134.4	1.9	96.1	1.2	52.3	0.6	59.3	0.4
LATIN AMERICA	0.8	0.0	8.3	0.1	3.6	0.0	1.0	0.0	10.2	0.1

<Note> From 1985/86 to 88/89: Accumulation of SITC-842 to 846 and 1989/90: SITC-8411 to 8459.
(Source) Federal Bureau of Statistics: *"Foreign Trade Statistics of Pakistan, Export & Re-exports, 1990"*

Table II-4-1a Installed Ring Spinning Machines
by Areas/Countries(Regions) and their Increase

(Unit: Mill. Spindles)

Year	1975		1980		1985	1990		1980-90
Areas/ Countries	No.	Share (%)	No.	Share (%)	No.	No.	Share (%)	Increase (%)
Asia & Oceania	65.38	(43.9)	67.90	(45.4)	78.62	99.68	(60.2)	47.0
Europe	47.99	(32.3)	44.57	(29.8)	37.00	30.93	(18.7)	- 31.8
North America	22.43	(15.1)	21.80	(14.6)	18.22	14.99	(9.1)	- 31.2
South America	8.20	(5.5)	8.58	(5.7)	8.61	11.94	(7.2)	39.2
Africa	4.80	(3.2)	6.64	(4.4)	7.29	8.00	(4.8)	20.5
TOTAL	148.81	(100)	149.49	(100)	149.73	165.54	(100)	10.7
China	18.00	(12.1)	17.00	(11.4)	22.50	38.00	(23.0)	123.5
India	19.54	(13.1)	21.08	(14.1)	24.73	26.65	(16.1)	26.4
U.S.A.	18.18	(12.2)	17.10	(11.4)	13.53	9.85	(5.9)	- 42.4
U.S.S.R	15.75	(10.6)	15.30	(10.2)	14.00	9.00	(5.4)	- 41.2
Brazil	4.36	(2.9)	4.47	(3.0)	4.70	8.00	(4.8)	79.0
Japan	11.49	(7.7)	10.19	(6.8)	9.36	7.68	(4.6)	- 24.7
* Pakistan	3.47	(2.3)	3.83	(2.6)	4.40	5.45	(3.3)	42.3
Indonesia	1.24	(0.8)	2.04	(1.4)	2.55	4.50	(2.7)	120.6
Turkey	2.66	(1.8)	3.09	(2.1)	3.20	3.77	(2.3)	22.0
Taiwan	3.05	(2.1)	3.39	(2.3)	3.84	3.68	(2.2)	8.6
Korea	1.94	(1.3)	3.15	(2.1)	3.27	3.65	(2.2)	15.9
Mexico	2.88	(1.9)	3.41	(2.3)	3.43	3.55	(2.1)	4.1
Thailand	1.07	(0.7)	1.16	(0.8)	1.80	3.00	(1.8)	158.6
Italy	3.78	(2.5)	3.23	(2.2)	2.25	1.98	(1.2)	- 38.7
Portugal	1.60	(1.1)	1.83	(1.2)	1.50	1.84	(1.1)	0.6
Spain	1.85	(1.2)	2.15	(1.4)	1.78	1.65	(1.0)	- 23.3
Bangladesh	-	(-)	-	(-)	-	1.50	(0.9)	-
Phillippine	1.12	(0.7)	1.13	(0.8)	1.50	1.47	(0.9)	30.1
Germany	3.60	(2.4)	2.45	(1.6)	1.81	1.37	(0.8)	- 44.1
Greece	0.96	(0.6)	1.43	(1.0)	1.47	1.17	(0.7)	- 18.2
Iran	1.00	(0.7)	1.12	(0.8)	1.10	1.10	(0.7)	- 1.8
France	3.23	(2.2)	2.19	(1.5)	1.24	0.71	(0.4)	- 67.6
U.K.	2.44	(1.6)	1.73	(1.2)	0.84	0.50	(0.3)	- 71.1

(Source) SENN-I SOGO KENKYUUSHO: "Textile Handbook 1991 & 1992"
(Original data: ITMF)

Table II-4-1b Installed OE Spinning Machines
by Countries(Regions) and their Increase

(Unit: 1,000 Rotors)

Year	1975	1980		1985		1990		1980-90
Countries	No.	No.	Share (%)	No.	Share (%)	No.	Share (%)	Increase (%)
TOTAL	-	3,588	(100)	6,582	(100)	7,922	(100)	120.8
U.S.S.R	-	1,770	(49.3)	4,000	(60.8)	4,000	(50.5)	126.0
U.S.A.	220	236	(6.6)	350	(5.3)	693	(8.8)	193.6
China (1)	-	-	(-)	125	(1.9)	400	(5.1)	220.0
Czecho-Slovakia	-	249	(6.9)	230	(3.5)	300	(3.8)	20.5
Poland	-	64	(1.8)	120	(1.8)	195	(2.5)	204.7
Japan	210	241	(6.7)	209	(3.2)	174	(2.2)	- 27.8
Taiwan	12	69	(1.9)	96	(1.5)	151	(1.9)	118.8
Brazil	22	46	(1.3)	68	(1.0)	150	(1.9)	226.1
Turkey	6	12	(0.3)	25	(0.4)	125	(1.6)	941.7
W. Germany	46	64	(1.8)	114	(1.7)	101	(1.3)	57.8
East Germany	-	56	(1.6)	100	(1.5)	100	(1.3)	78.6
Rumania	-	27	(0.8)	70	(1.1)	100	(1.3)	270.4
France	27	95	(2.7)	123	(1.9)	98	(1.2)	3.2
Italy	53	82	(2.3)	73	(1.1)	85	(1.1)	3.7
* Pakistan	1	16	(0.5)	35	(0.5)	72	(0.9)	350.0
Spain	48	47	(1.3)	64	(1.0)	69	(0.9)	46.8
India	-	1	(0.0)	12	(0.2)	67	(0.9)	6,600.0
Indonesia	-	5	(0.1)	29	(0.4)	60	(0.8)	1,100.0
Hong Kong	43	68	(1.9)	52	(0.8)	55	(0.7)	- 19.1
Yugoslavia	-	41	(1.1)	40	(0.6)	51	(0.6)	24.4
Bulgaria	3	28	(0.8)	30	(0.5)	50	(0.6)	78.6
Mexico	15	22	(0.6)	33	(0.5)	46	(0.6)	109.1
Thailand	1	3	(0.1)	8	(0.1)	45	(0.6)	1,400.0
Egypt	1	37	(1.0)	42	(0.6)	44	(0.6)	18.9
Phillippine	-	11	(0.3)	13	(0.2)	44	(0.6)	300.0
Hungary	28	38	(1.1)	41	(0.6)	40	(0.5)	5.3
Morocco	1	18	(0.5)	28	(0.4)	40	(0.5)	122.2
Korea	2	18	(0.5)	32	(0.5)	38	(0.5)	111.1

(1) Increase 1985-90

(Source) SENN-I SOGO KENKYUUSHO: "Textile Handbook 1991 & 1992"
(Original data: ITMF)

Table II-4-2 Installed Cotton-type Weaving Machines by Areas/Countries(Regions)

(Unit: 1,000 units, % Share)

Year	1989		1990	
Areas/ Countries	Shuttle-less Looms	Shuttle Looms	Shuttle-less Looms	Shuttle Looms
Asia & Oceania	138.0 (25.1)	1,493.3 (68.3)	157.9 (26.3)	1,499.4 (69.5)
Europe	293.6 (53.3)	261.5 (12.0)	313.5 (52.3)	249.9 (11.6)
South America	20.2 (3.7)	184.0 (8.4)	27.6 (4.6)	186.6 (8.6)
Africa	17.1 (3.1)	136.5 (6.2)	17.5 (2.9)	126,3 (5.8)
North America	81.8 (14.9)	112.5 (5.1)	83.0 (13.8)	96.3 (4.5)
TOTAL	550.6 (100)	2,187.7 (100)	599.4 (100)	2,158.5 (100)

(Unit: Number, % Share)

China	15,000	785,000 (35.9)	16,000	850,000 (39.4)
India *	2,880	185,260 (8.5)	3,600	174,640 (8.1)
Japan	37,350	154,900 (7.1)	45,400	146,530 (6.8)
Brazil	8,500	130,000 (5.9)	15,000	135,000 (6.3)
Indonesia *	10,000	125,000 (5.7)	15,000	125,000 (5.8)
U.S.S.R.	175,000	85,000 (3.9)	185,000	75,000 (3.5)
Thailand	3,500	60,000 (2.7)	4,000	60,000 (2.8)
Egypt	4,000	55,000 (2.5)	4,000	45,000 (2.1)
U.S.A.	65,550	55,870 (2.6)	66,070	40,900 (1.9)
Mexico	11,000	35,000 (1.6)	11,500	35,000 (1.6)
Korea	20,000	32,560 (1.5)	25,000	30,000 (1.4)
Poland	9,880	14,570 (0.7)	13,010	21,940 (1.0)
Portugal	7,500	20,000 (0.9)	8,000	19,500 (0.9)
Taiwan	27,000	47,000 (2.1)	22,870	18,030 (0.8)
Argentina	4,000	17,000 (0.8)	4,000	17,000 (0.8)
Yugoslavia	1,500	15,400 (0.7)	1,160	15,100 (0.7)
Czecho-Slovakia	7,000	18,000 (0.8)	7,500	15,000 (0.7)
Nigeria	2,500	15,000 (0.7)	2,500	15,000 (0.7)
Vietnam	120	11,000 (0.5)	350	11,000 (0.5)
* Pakistan*	4,000	12,000 (0.5)	5,000	10,000 (0.5)

* Mill sector only

(Source) SENN-I SOGO KENKYUUSHO: "Textile Handbook 1991 & 1992"
(Original data: ITMF)

Table II-4-3 Cotton Yarn: Production by Countries(Regions)

(Unit: 1,000 tons)

Year	1980	1985	1988	1989	1990 [1]	1991 [1]
World Total [2]	12,441	14,389	16,615	17,004	16,868	17,100
China	2,926	3,505	4,656	4,740	4,574	4,728
U.S.S.R.	1,636	1,742	1,764	1,760	1,709	1,643
India	1,058	1,260	1,297	1,337	1,449	1,511
U.S.A.	1,114	977	1,227	1,398	1,412	1,401
* Pakistan	368	417	641	725	916	1,002
Brazil	510	963	697	674	607	607
Indonesia	133	260	405	485	541	593
Korea	270	471	561	547	540	555
Japan	504	437	464	460	435	435
Turkey	280	293	356	356	360	368
Taiwan	171	368	412	415	331	307
Egypt	232	243	250	249	268	271
Italy	201	171	213	226	228	241
Hong Kong	164	142	211	217	240	240
Germany [3]	307	337	344	340	252	219
Thailand	101	124	193	202	209	217
Portugal	101	137	163	153	158	163
Rumania	184	180	165	157	150	140
Poland	217	184	205	176	144	137
Czecho-Slovakia	135	142	147	147	141	128
Argentina	75	91	100	96	98	93
Bangladesh	43	43	50	58	59	63

Note: 1. Provisional for 1990, Estimates for 1991
2. Including estimates
3. Total of the late W. Germany and E. Germany

(Source) SENN-I SOGO KENKYUUSHO: "Textile Handbook 1991 & 1992"
(Original data: ICAC: "Cotton: World Statistics")

Table II-4-4 Cotton Fabric: Production by Countries(Regions)

(Unit: 1,000 tons)

Year	1980	1985	1988	1989	1990 [1]	1991 [1]
World Total [2]	7,215	7,782	9,199	9,382	9,390	9,488
China	1,637	1,726	2,184	2,223	2,145	2,217
India	991	1,034	1,210	1,229	1,333	1,389
U.S.S.R.	969	1,050	1,101	1,099	1,063	1,026
U.S.A.	728	618	731	722	786	752
Indonesia	80	107	389	466	520	570
Turkey	194	280	324	324	328	335
Japan	293	344	339	331	305	305
Taiwan	98	142	281	283	226	209
Germany [3]	205	231	235	230	204	205
Thailand	101	125	182	190	196	204
Italy	138	167	165	178	178	189
Hong Kong	87	85	107	109	119	119
Korea	70	82	88	88	88	91
Portugal	62	76	87	81	84	87
Argentina	85	81	88	80	87	83
Mexico	67	74	83	87	83	82
Egypt	77	75	72	72	78	79
Czecho-Slovakia	75	80	80	81	77	77
Phillippines	34	25	65	71	73	76
Poland	107	112	99	85	69	66
* Pakistan	45	35	36	44	56	61
Bangladesh	10	8	8	9	9	10

Note: 1. Provisional for 1990, Estimates for 1991
2. Including estimates
3. Total of the late W. Germany and E. Germany

(Source) SENN-I SOGO KENKYUUSHO: "Textile Handbook 1991 & 1992"
(Original data: ICAC: "Cotton: World Statistics")

Table II-4-5a Textile exports of selected economies, 1980 and 1987-89
[Export Value & Share]

(Unit) Export Value: US$,Mill.; Share: (%)

Exporters	1980		1987		1988		1989	
WORLD MARKET	55600	(100)	82400	(100)	92850	(100)	98000	(100)
GERMANY, FED	6249	(11.3)	9698	(11.8)	10569	(11.4)	11073	(11.3)
ITALY	4158	(7.5)	7297	(8.9)	7490	(8.1)	7966	(8.1)
HONG KONG A	1771	(3.2)	5668	(6.9)	6371	(6.9)	7574	(7.7)
CHINA	2572	(4.6)	5790	(7.0)	6458	(7.0)	6994	(7.1)
JAPAN	5117	(9.2)	5597	(6.8)	5527	(6.0)	5534	(5.6)
TAIWAN	1775	(3.2)	4087	(5.0)	4545	(4.9)	5442	(5.6)
KOREA	2209	(4.0)	4080	(5.0)	4848	(5.2)	5371	(5.5)
BEL-LUX	3550	(6.4)	4599	(5.6)	4978	(5.4)	5297	(5.4)
FRANCE	3432	(6.2)	4216	(5.1)	4627	(5.0)	4967	(5.1)
U S A	3757	(6.8)	3127	(3.8)	3890	(4.2)	4370	(4.5)
U K	3108	(5.6)	3016	(3.7)	3447	(3.7)	3605	(3.7)
NETHERLANDS	2259	(4.1)	2920	(3.5)	3035	(3.3)	2376	(2.4)
SWITZERLAND	1521	(2.7)	2118	(2.6)	2188	(2.4)	2116	(2.2)
PAKISTAN	876	(1.6)	1854	(2.3)	1810	(1.9)	2042	(2.1)
AUSTRIA	1074	(2.0)	1456	(1.8)	1569	(1.7)	1641	(1.7)
TURKEY	343	(0.6)	1191	(1.4)	1338	(1.4)	1230	(1.3)
SPAIN	698	(1.3)	955	(1.2)	1112	(1.2)	1151	(1.2)
PORTUGAL	605	(1.1)	905	(1.1)	1058	(1.1)	1077	(1.1)
BRAZIL	654	(1.2)	738	(0.9)	850	(0.9)	800	(0.8)
SINGAPORE	367	(0.7)	633	(0.8)	689	(0.7)	798	(0.8)
INDONESIA	46	(0.1)	469	(0.6)	680	(0.7)	828	(0.8)
DENMARK	423	(0.8)	591	(0.7)	616	(0.7)	574	(0.6)
SWEDEN	421	(0.8)	575	(0.7)	565	(0.6)	555	(0.6)
CANADA	306	(0.6)	473	(0.6)	575	(0.6)	602	(0.6)
YUGOSLAVIA	379	(0.7)	422	(0.5)	508	(0.5)	542	(0.6)
IRELAND	447	(0.8)	469	(0.6)	516	(0.6)	490	(0.5)
GREECE	482	(0.9)	630	(0.8)	461	(0.5)	496	(0.5)
U S S R	172	(0.3)	366	(0.4)	437	(0.5)	458	(0.5)
HUNGARY	248	(0.4)	289	(0.4)	290	(0.3)	264	(0.3)
MOROCCO	122	(0.2)	165	(0.2)	176	(0.2)	167	(0.2)
AUSTRALIA	142	(0.3)	192	(0.2)	111	(0.1)	128	(0.1)
MACAO	103	(0.2)	144	(0.2)	136	(0.1)	134	(0.1)
INDIA	1145	(2.1)	1540	(1.9)	1760	(1.9)	—	(—)
THAILAND	330	(0.6)	648	(0.8)	765	(0.8)	—	(—)
EGYPT	259	(0.5)	1268	(1.5)	496	(0.5)	—	(—)
IRAN	589	(1.1)	565	(0.7)	475	(0.5)	—	(—)
BANGLADESH	414	(0.7)	302	(0.4)	280	(0.3)	—	(—)
MALAYSIA	161	(0.3)	229	(0.3)	245	(0.3)	—	(—)
PERU	153	(0.3)	151	(0.2)	148	(0.2)	—	(—)
ARGENTINA	36	(0.1)	148	(0.2)	148	(0.2)	—	(—)
COLOMBIA	135	(0.2)	109	(0.1)	96	(0.1)	—	(—)
URUGUAY	43	(0.1)	54	(0.1)	56	(0.1)	—	(—)
PHILIPPINES	75	(0.1)	68	(0.1)	71	(0.1)	—	(—)
SRI LANKA	3	(-)	34	(-)	38	(-)	—	(—)
POLAND	460	(0.8)	292	(0.4)	—	( )	—	(—)

<Note> A : Includes re-exports. In millions of dollars, they amounted to $861 in 1980, $3616 in 1987, $4379 in 1988 and $5418 in 1989.

(Source) GATT: '*International Trade 89-90*', *Vol. II*

Table II-4-5b Textile exports of selected economies, 1980 and 1987-89
[Rate of Increase of Share]

(Unit) Export Value: US$,Mill.; Share: (%)

Exporters	1980		1987		1988		1989		Rate of Increase of Share
WORLD MARKET	55600	(100)	82400	(100)	92850	(100)	98000	(100)	...
INDONESIA	46	(0.1)	469	(0.6)	680	(0.7)	828	(0.8)	700.0
HONG KONG ^	1771	(3.2)	5668	(6.9)	6371	(6.9)	7574	(7.7)	140.6
TURKEY	343	(0.6)	1191	(1.4)	1338	(1.4)	1230	(1.3)	116.7
ARGENTINA	36	(0.1)	148	(0.2)	148	(0.2)	—	(—)	100.0
TAIWAN	1775	(3.2)	4087	(5.0)	4545	(4.9)	5442	(5.6)	75.0
U S S R	172	(0.3)	366	(0.4)	437	(0.5)	458	(0.5)	66.7
CHINA	2572	(4.6)	5790	(7.0)	6458	(7.0)	6994	(7.1)	54.3
KOREA	2209	(4.0)	4080	(5.0)	4848	(5.2)	5371	(5.5)	37.5
THAILAND	330	(0.6)	648	(0.8)	765	(0.8)	—	(—)	33.3
PERU	153	(0.3)	151	(0.2)	148	(0.2)	—	(—)	33.3
PAKISTAN	876	(1.6)	1854	(2.3)	1810	(1.9)	2042	(2.1)	31.3
SINGAPORE	367	(0.7)	633	(0.8)	689	(0.7)	798	(0.8)	14.3
ITALY	4158	(7.5)	7297	(8.9)	7490	(8.1)	7966	(8.1)	8.0
GERMANY, FED	6249	(11.3)	9698	(11.8)	10569	(11.4)	11073	(11.3)	—
PORTUGAL	605	(1.1)	905	(1.1)	1058	(1.1)	1077	(1.1)	—
CANADA	306	(0.6)	473	(0.6)	575	(0.6)	602	(0.6)	—
MOROCCO	122	(0.2)	165	(0.2)	176	(0.2)	167	(0.2)	—
EGYPT	259	(0.5)	1268	(1.5)	496	(0.5)	—	(—)	—
URUGUAY	43	(0.1)	54	(0.1)	56	(0.1)	—	(—)	—
PHILIPPINES	75	(0.1)	68	(0.1)	71	(0.1)	—	(—)	—
MALYSIA	161	(0.3)	229	(0.3)	245	(0.3)	—	(—)	—
POLAND	460	(0.8)	292	(0.4)	—	(—)	—	(—)	—
SRI LANKA	3	(—)	34	(—)	38	(—)	—	(—)	—
SPAIN	698	(1.3)	955	(1.2)	1112	(1.2)	1151	(1.2)	-7.7
INDIA	1145	(2.1)	1540	(1.9)	1760	(1.9)	—	(—)	-9.5
YUGOSLAVIA	379	(0.7)	422	(0.5)	508	(0.5)	542	(0.6)	-14.3
AUSTRIA	1074	(2.0)	1456	(1.8)	1569	(1.7)	1641	(1.7)	-15.0
BEL-LUX	3550	(6.4)	4599	(5.6)	4978	(5.4)	5297	(5.4)	-15.6
FRANCE	3432	(6.2)	4216	(5.1)	4627	(5.0)	4967	(5.1)	-17.7
SWITZERLAND	1521	(2.7)	2118	(2.6)	2188	(2.4)	2116	(2.2)	-18.5
HUNGARY	248	(0.4)	289	(0.4)	290	(0.3)	264	(0.3)	-25.0
DENMARK	423	(0.8)	591	(0.7)	616	(0.7)	574	(0.6)	-25.0
SWEDEN	421	(0.8)	575	(0.7)	565	(0.6)	555	(0.6)	-25.0
BRAZIL	654	(1.2)	738	(0.9)	850	(0.9)	800	(0.8)	-33.3
U S A	3757	(6.8)	3127	(3.8)	3890	(4.2)	4370	(4.5)	-33.8
U K	3108	(5.6)	3016	(3.7)	3447	(3.7)	3605	(3.7)	-33.9
IRELAND	447	(0.8)	469	(0.6)	516	(0.6)	490	(0.5)	-37.5
JAPAN	5117	(9.2)	5597	(6.8)	5527	(6.0)	5534	(5.6)	-39.1
NETHERLANDS	2259	(4.1)	2920	(3.5)	3035	(3.3)	2376	(2.4)	-41.5
GREECE	482	(0.9)	630	(0.8)	461	(0.5)	496	(0.5)	-44.5
COLOMBIA	135	(0.2)	109	(0.1)	96	(0.1)	—	(—)	-50.0
MACAO	103	(0.2)	144	(0.2)	136	(0.1)	134	(0.1)	-50.0
IRAN	589	(1.1)	565	(0.7)	475	(0.5)	—	(—)	-54.5
BANGLADESH	414	(0.7)	302	(0.4)	280	(0.3)	—	(—)	-57.1
AUSTRALIA	142	(0.3)	192	(0.2)	111	(0.1)	128	(0.1)	-66.7

<Note> ^ : Includes re-exports. In millions of dollars, they amounted to $861 in 1980, $3616 in 1987, $4379 in 1988 and $5418 in 1989.

(Source) GATT: '*International Trade 89-90*', *Vol. II*

Table II-4-5c Textile exports of selected economies, 1980 and 1987-89
[Average Annual Growth Rate]

(Unit) Export Value: US$,Mill.; Growth Rate: (%)

Exporters	1980	1987	1988	(Growth Rate)	1989	(Growth Rate)	Average Annual Growth Rate (1980-89)
WORLD MARKET	55600	82400	92850	(12.7)	98000	(5.5)	6.5
INDONESIA	46	469	680	(45.0)	828	(21.8)	37.9
SRI LANKA	3	34	38	(11.8)	—	(-)	37.4
ARGENTINA	36	148	148	(-)	—	(-)	19.3
HONG KONG ^	1771	5668	6371	(12.4)	7574	(18.9)	17.5
TURKEY	343	1191	1338	(12.3)	1230	(8.1)	15.2
TAIWAN	1775	4087	4545	(11.2)	5442	(19.7)	13.3
THAILAND	330	648	765	(18.1)	—	(-)	11.8
CHINA	2572	5790	6458	(11.5)	6994	(8.3)	11.8
U S S R	172	366	437	(19.4)	458	(4.8)	11.5
KOREA	2209	4080	4848	(18.8)	5371	(10.8)	10.4
PAKISTAN	876	1854	1810	(-2.4)	2042	(12.8)	9.9
SINGAPORE	367	633	689	(8.8)	798	(15.8)	9.0
EGYPT	259	1268	496	(-60.9)	—	(-)	8.5
CANADA	306	473	575	(21.6)	602	(4.7)	7.8
ITALY	4158	7297	7490	(2.6)	7966	(6.4)	7.5
PORTUGAL	605	905	1058	(16.9)	1077	(1.8)	6.6
GERMANY, FED	6296	9698	10569	(9.0)	11073	(4.8)	6.5
SPAIN	698	955	1112	(16.4)	1151	(3.5)	5.7
INDIA	1145	1540	1760	(14.3)	—	(-)	5.5
MALAYSIA	161	229	245	(7.0)	—	(-)	5.4
AUSTRIA	1074	1456	1569	(7.8)	1641	(4.6)	4.8
BEL-LUX	3550	4599	4978	(8.2)	5297	(6.4)	4.5
FRANCE	3432	4216	4627	(9.7)	4967	(7.3)	4.2
YUGOSLAVIA	379	422	508	(20.4)	542	(6.7)	4.1
SWITZERLAND	1521	2118	2188	(3.3)	2116	(-3.3)	3.7
DENMARK	423	591	616	(4.2)	574	(-6.8)	3.5
MOROCCO	122	165	176	(6.7)	167	(-5.1)	3.5
URUGUAY	43	54	56	(3.7)	—	(-)	3.4
SWEDEN	421	575	585	(1.7)	555	(-1.8)	3.1
MACAO	103	144	136	(-5.6)	134	(1.5)	3.0
BRAZIL	654	738	850	(15.2)	800	(-5.9)	2.3
U K	3108	3016	3447	(14.3)	3605	(4.6)	1.7
U S A	3757	3127	3890	(24.4)	4370	(12.3)	1.7
IRELAND	447	469	516	(10.2)	490	(-5.0)	1.0
JAPAN	5117	5597	5527	(-1.3)	5534	(0.1)	0.9
HUNGARY	248	289	290	(0.3)	264	(-9.0)	0.7
PHILIPPINES	75	68	71	(4.4)	—	(-)	0.7
NETHERLANDS	2259	2920	3035	(3.9)	2376	(21.7)	0.6
GREECE	482	630	461	(-26.8)	496	(7.6)	0.3
PERU	153	151	148	(2.0)	—	(-)	-0.4
AUSTRALIA	142	192	111	(-42.2)	128	(15.3)	-1.2
IRAN	589	565	475	(-15.9)	—	(-)	-2.7
COLOMBIA	135	109	96	(-11.9)	—	(-)	-4.4
BANGLADESH	414	302	280	(7.3)	—	(-)	-5.0
POLAND	460	292	—	(-)	—	(-)	-6.7

<Note> ^ : Includes re-exports. In millions of dollars, they amounted to $861 in 1980, $3616 in 1987, $4379 in 1988 and $5418 in 1989.

(Source) GATT: "*International Trade 89-90*", *Vol. II*

Table II-4-6a Clothing exports of selected economies, 1980 and 1987-89
[Export Value & Share]

(Unit) Export Value: US$,Mill.; Share: (%)

Exporters	1980		1987		1988		1989	
WORLD MARKET	41800	(100)	81200	(100)	89450	(100)	98000	(100)
HONG KONG A	4976	(11.9)	10720	(13.2)	11786	(13.2)	13994	(14.3)
ITALY	4584	(11.0)	9013	(11.1)	9082	(10.2)	9449	(9.6)
KOREA	2949	(7.1)	7537	(9.3)	8695	(9.7)	9096	(9.3)
CHINA	1683	(4.0)	3740	(4.6)	4872	(5.4)	6130	(6.3)
GERMANY, FED	2882	(6.9)	5013	(6.2)	5374	(6.0)	5632	(5.7)
TAIWAN	2430	(5.8)	4989	(6.1)	4708	(5.3)	4735	(4.8)
FRANCE	2294	(5.5)	3052	(3.8)	3302	(3.7)	3626	(3.7)
TURKEY	131	(0.3)	2214	(2.7)	2352	(2.6)	2773	(2.8)
PORTUGAL	631	(1.5)	2056	(2.5)	2296	(2.6)	2585	(2.6)
U K	1878	(4.5)	2348	(2.9)	2520	(2.8)	2362	(2.4)
THAILAND	267	(0.6)	1500	(1.8)	1825	(2.0)	2335	(2.4)
U S A	1264	(3.0)	1209	(1.5)	1640	(1.8)	2211	(2.3)
INDIA	590	(1.4)	1440	(1.8)	1545	(1.7)	1920	(2.0)
NETHERLANDS	875	(2.1)	1384	(1.7)	1512	(1.7)	1572	(1.6)
BRL-LUX	999	(2.4)	1371	(1.7)	1383	(1.5)	1467	(1.5)
GREECE	398	(1.0)	1444	(1.8)	1202	(1.3)	1474	(1.5)
SINGAPORE	427	(1.0)	998	(1.2)	1239	(1.4)	1393	(1.4)
INDONESIA	98	(0.2)	596	(0.7)	797	(0.9)	1146	(1.2)
MACAO	422	(1.0)	880	(1.1)	964	(1.1)	1043	(1.1)
AUSTRIA	580	(1.4)	958	(1.2)	954	(1.1)	920	(0.9)
TUNISIA	339	(0.8)	550	(0.7)	645	(0.7)	776	(0.8)
DENMARK	379	(0.9)	745	(0.9)	708	(0.8)	643	(0.7)
PAKISTAN	103	(0.2)	607	(0.7)	623	(0.7)	567	(0.6)
JAPAN	488	(1.2)	641	(0.8)	588	(0.7)	585	(0.6)
FINLAND	729	(1.7)	677	(0.8)	602	(0.7)	487	(0.5)
SWITZERLAND	366	(0.9)	466	(0.6)	508	(0.6)	510	(0.5)
YUGOSLAVIA	421	(1.0)	568	(0.7)	519	(0.6)	473	(0.5)
SPAIN	312	(0.7)	506	(0.6)	505	(0.6)	478	(0.5)
SRI LANKA	109	(0.3)	427	(0.5)	436	(0.5)	475	(0.5)
MOROCCO	109	(0.3)	449	(0.6)	490	(0.5)	509	(0.5)
HUNGARY	343	(0.8)	374	(0.5)	396	(0.4)	344	(0.4)
IRELAND	207	(0.5)	315	(0.4)	333	(0.4)	343	(0.4)
SWEDEN	295	(0.7)	371	(0.5)	353	(0.4)	329	(0.3)
CANADA	211	(0.5)	360	(0.4)	377	(0.4)	318	(0.3)
BRAZIL	138	(0.3)	214	(0.3)	240	(0.3)	190	(0.2)
MALAYSIA	150	(0.4)	608	(0.7)	831	(0.9)	—	(-)
MAURITIUS	73	(0.2)	434	(0.5)	495	(0.6)	—	(-)
BANGLADESH	2	(-)	416	(0.5)	450	(0.5)	—	(-)
PHILIPPINES	279	(0.7)	372	(0.5)	441	(0.5)	—	(-)
DOMINICAN REP	0	(-)	200	(0.2)	290	(0.3)	—	(-)
COLOMBIA	119	(0.3)	112	(0.1)	209	(0.2)	—	(-)
JAMAICA	7	(-)	103	(0.1)	106	(0.1)	—	(-)

<Note> A : Includes re-exports. In millions of dollars, they amounted to $312 in 1980, $2344 in 1987, $3164 in 1988 and $4780 in 1989.

(Source) GATT: "*International Trade 89-90*", *Vol. II*

Table II-4-6b Clothing exports of selected economies, 1980 and 1987-89
[Rate of Increase of Share]

(Unit) Export Value: US$,Mill.; Share: (%)

Exporters	1980		1987		1988		1989		Rate of increase of Share
WORLD MARKET	41800	(100)	81200	(100)	89450	(100)	98000	(100)	...
TURKEY	131	(0.3)	2214	(2.7)	2352	(2.6)	2773	(2.8)	833.3
INDONESIA	98	(0.2)	596	(0.7)	797	(0.9)	1146	(1.2)	500.0
THAILAND	267	(0.6)	1500	(1.8)	1825	(2.0)	2335	(2.4)	300.0
PAKISTAN	103	(0.2)	607	(0.7)	623	(0.7)	567	(0.6)	200.0
MAURITIUS	73	(0.2)	434	(0.5)	495	(0.6)	—	(-)	200.0
MALAYSIA	150	(0.4)	608	(0.7)	831	(0.9)	—	(-)	125.0
PORTUGAL	631	(1.5)	2056	(2.5)	2296	(2.6)	2585	(2.6)	73.3
SRI LANKA	109	(0.3)	427	(0.5)	436	(0.5)	475	(0.5)	66.7
MOROCCO	109	(0.3)	449	(0.6)	490	(0.5)	509	(0.5)	66.7
CHINA	1683	(4.0)	3740	(4.6)	4872	(5.4)	6130	(6.3)	57.5
GREECE	398	(1.0)	1444	(1.8)	1202	(1.3)	1474	(1.5)	50.0
INDIA	590	(1.4)	1440	(1.8)	1545	(1.7)	1920	(2.0)	42.9
SINGAPORE	427	(1.0)	998	(1.2)	1239	(1.4)	1393	(1.4)	40.0
COLOMBIA	119	(0.3)	112	(0.1)	209	(0.2)	—	(-)	33.3
KOREA	2949	(7.1)	7537	(9.3)	8695	(9.7)	9096	(9.3)	31.0
HONG KONG ^	4976	(11.9)	10720	(13.2)	11786	(13.2)	13994	(14.3)	20.2
MACAO	422	(1.0)	880	(1.1)	964	(1.1)	1043	(1.1)	10.0
TUNISIA	339	(0.8)	550	(0.7)	645	(0.7)	776	(0.8)	—
DOMINICAN REP	0	(-)	200	(0.2)	290	(0.3)	—	(-)	—
BANGLADESH	2	(-)	416	(0.5)	450	(0.5)	—	(-)	—
JAMAICA	7	(-)	103	(0.1)	106	(0.1)	—	(-)	—
ITALY	4584	(11.0)	9013	(11.1)	9082	(10.2)	9449	(9.6)	-12.7
TAIWAN	2430	(5.8)	4989	(6.1)	4708	(5.3)	4735	(4.8)	-17.2
GERMANY,FED	2882	(6.9)	5013	(6.2)	5374	(6.0)	5632	(5.7)	-17.4
IRELAND	207	(0.5)	315	(0.4)	333	(0.4)	343	(0.4)	-20.0
DENMARK	379	(0.9)	745	(0.9)	708	(0.8)	643	(0.7)	-22.2
U S A	1264	(3.0)	1209	(1.5)	1640	(1.8)	2211	(2.3)	-23.3
NETHERLANDS	875	(2.1)	1384	(1.7)	1512	(1.7)	1572	(1.6)	-23.8
PHILIPPINES	279	(0.7)	372	(0.5)	441	(0.5)	—	(-)	-28.6
SPAIN	312	(0.7)	506	(0.6)	505	(0.6)	478	(0.5)	-28.6
FRANCE	2294	(5.5)	3052	(3.8)	3302	(3.7)	3626	(3.7)	-32.7
BRAZIL	138	(0.3)	214	(0.3)	240	(0.3)	190	(0.2)	-33.3
AUSTRIA	580	(1.4)	958	(1.2)	954	(1.1)	920	(0.9)	-35.7
BEL-LUX	999	(2.4)	1371	(1.7)	1383	(1.5)	1467	(1.5)	-37.5
CANADA	211	(0.5)	360	(0.4)	377	(0.4)	318	(0.3)	-40.0
SWITZERLAND	366	(0.9)	466	(0.6)	508	(0.6)	510	(0.5)	-44.4
U K	1878	(4.5)	2348	(2.9)	2520	(2.8)	2362	(2.4)	-46.7
JAPAN	488	(1.2)	641	(0.8)	588	(0.7)	565	(0.6)	-50.0
YUGOSLAVIA	421	(1.0)	568	(0.7)	519	(0.6)	473	(0.5)	-50.0
HUNGARY	343	(0.8)	374	(0.5)	396	(0.4)	344	(0.4)	-50.0
SWEDEN	295	(0.7)	371	(0.5)	353	(0.4)	329	(0.3)	-57.1
FINLAND	729	(1.7)	677	(0.8)	602	(0.7)	487	(0.5)	-70.6

<Note> ^ : Includes re-exports. In millions of dollars, they amounted to $312 in 1980, $2344 in 1987, $3164 in 1988 and $4780 in 1989.

(Source) GATT: '*International Trade 89-90*', *Vol. II*

Table II-4-6c Clothing exports of selected economies, 1980 and 1987-89
[Average Annual Growth Rate]

(Unit) Export Value: US$,Mill.; Growth Rate: (%)

Exporters	1980	1987	1988	(Growth Rate)	1989	(Growth Rate)	Average Annual Growth Rate (1980-89)
WORLD MARKET	41800	81200	89450	(10.2)	98000	(9.6)	9.9
BANGLADESH	2	416	450	(8.2)	—	(-)	96.8
JAMAICA	7	103	106	(2.9)	—	(-)	40.5
TURKEY	131	2214	2352	(6.2)	2773	(17.9)	40.4
INDONESIA	98	596	797	(33.7)	1146	(43.8)	31.4
THAILAND	267	1500	1825	(21.7)	2335	(27.9)	27.2
MAURITIUS	73	434	495	(14.1)	—	(-)	27.0
MALAYSIA	150	608	831	(36.7)	—	(-)	23.9
PAKISTAN	103	607	623	(2.6)	567	(-9.0)	20.9
MOROCCO	109	449	490	(9.1)	509	(3.9)	18.7
SRI LANKA	109	427	436	(2.1)	475	(8.9)	17.8
PORTUGAL	631	2056	2298	(11.6)	2585	(12.6)	17.0
GREECE	398	1444	1202	(-16.8)	1474	(22.6)	15.7
CHINA	1683	3740	4872	(30.0)	6130	(25.8)	15.4
INDIA	590	1440	1545	(7.3)	1920	(24.3)	14.0
SINGAPORE	427	998	1239	(24.1)	1393	(12.4)	14.0
BRAZIL	138	214	240	(12.1)	190	(-20.8)	13.9
KOREA	2949	7537	8695	(15.4)	9096	(4.6)	13.3
HONG KONG ^	4976	10720	11786	(9.9)	13994	(18.7)	12.2
MACAO	422	880	964	(9.5)	1043	(8.2)	10.6
TUNISIA	339	550	645	(17.3)	776	(20.3)	9.6
ITALY	4584	9013	9082	(0.8)	9449	(4.0)	8.4
GERMANY, FED	2882	5013	5374	(7.2)	5632	(4.8)	7.7
TAIWAN	2430	4989	4708	(-5.6)	4735	(0.6)	7.7
COLOMBIA	119	112	209	(86.6)	—	(-)	7.3
NETHERLANDS	875	1384	1512	(9.2)	1572	(4.0)	6.7
U S A	1264	1209	1640	(35.6)	2211	(34.8)	6.4
DENMARK	379	745	708	(-5.0)	643	(-9.2)	6.1
PHILIPPINES	279	372	441	(18.5)	—	(-)	5.9
IRELAND	207	315	333	(5.7)	343	(3.0)	5.8
AUSTRIA	580	958	954	(-0.4)	920	(-3.6)	5.3
FRANCE	2294	3052	3302	(8.2)	3626	(9.8)	5.2
SPAIN	312	506	505	(-0.2)	478	(5.3)	4.9
CANADA	211	360	377	(14.7)	318	(-15.6)	4.7
BEL-LUX	999	1371	1383	(0.9)	1467	(6.1)	4.4
SWITZERLAND	366	466	508	(9.0)	510	(0.4)	3.8
U K	1878	2348	2520	(7.3)	2362	(-6.3)	2.6
JAPAN	488	641	588	(-8.3)	565	(-3.9)	1.6
YUGOSLAVIA	421	568	519	(-8.6)	473	(-8.9)	1.3
SWEDEN	295	371	353	(-4.9)	329	(-6.8)	1.2
DOMINICAN REP	0	200	290	(45.0)	—	(-)	—
HUNGARY	343	374	396	(5.9)	344	(-13.1)	—
FINLAND	729	677	602	(-11.1)	487	(-19.1)	-4.6

<Note) ^ : Includes re-exports. In millions of dollars, they amounted to $312 in 1980, $2344 in 1987, $3164 in 1988 and $4780 in 1989.

(Source) GATT: '*International Trade 89-90*', *Vol. II*