Whatever the case, augmentation of the testing and inspection functions and provision of the equipment for the same are necessary and training of inspectors is essential. To develop the human resources for high level testing and inspection, proposal would like to be made of overseas training of the relevant personnel and engagement of testing experts.

An important function which the TID should strengthen is the collection and supply of information. In regard to this, it will be necessary to train information staff and to strengthen the cooperative relationships with the DEP and industrial organizations so as to gather and analyze information more efficiently and also to disseminate the information to the related industries through publication of a textile information journal. This would help raise the technical level of textile related companies and their product development capabilities and further would, through stimulation of the flow of information among textile sectors, perform the role of assisting the expansion of linkage among the same.

The TID would be able to make use of the above training, inspection, and information functions to engage in various activities answering the needs of the industry. For example, it could sponsor seminars and work shops for the improvement of technology in dyeing and printing, seminars on converter functions, seminars on the significance of designs and brands, and seminars on water supply and wastewater in the dyeing sector. By introduction of the principle of the beneficiaries paying for these and other services, the TID could more readily lay acquire materials and information in accordance with user needs and improve its services.

Note that when introducing the principle of payment by beneficiaries, it would be desirable for the TID to fundamentally operate on a self-accounting basis. Several options are available, however, such as the establishment of a "users association" representing the users.

[Plan in Detail - 3]

Draft Schedule of TID Enlargement Plan by Stage

Common Sector	Textile Sector	Garment Sector
First stage		
• Engagement of organizational experts • Preparation of draft of enlargement plan • Preparation of detailed proposal for introduction of principle of beneficiaries paying for services (fee-basis system)	• Consultation with related industrial organizations	• Consultation with related industrial organizations
• Dispatch of trainees overseas for training of testing and information staff	• Dispatch of trainees overseas for training of instructors (weaving, dyeing, finishing, etc.)	• Dispatch of trainees overseas for training of instructors (garment production control)
• Sponsoring of seminars on converter function	• Sponsoring of seminars and work shops on weaving, dyeing, finishing, etc. • Sponsoring of seminars on water supply and wastewater in dyeing sector	• Sponsoring of seminars on export markets for garments (DEP) • Sponsoring of seminars and work shops on production control for garments
(Formulation of textile industry "vision")	(Feasibility study of industrial estate for dyeing)	(Formulation of plan for promotion of small and medium sized companies and subcontractors and plan for personnel training)
Second stage		
• Formulation of enlargement plan • Start of fee-basis system (establishment of users association)	• Establishment of system of cooperation with related industrial organizations	• Establishment of system of cooperation with related industrial organizations
• Equipping of materials and equipment for testing and inspection • Engagement of experts for above • Start of fee-basis system for tesitng and inspection	• Promotion of private utilization of testing and inspection services • Formulation of job training plan (including equipping of materials and equipment and engagement of experts)	• Promotion of private utilization of testing and inspection services • Formulation of job training plans (including equipping of materials and equipment and engagement of experts)
• Strengthening of information collection and supply system (cooperation with DEP) • Publication of information journal	• Collection and accumulation of technical information and promotion of use thereof	• Collection of technical and market information and promotion of active use thereof
	• Seminars and work shops on weaving, dyeing, finishing, etc. (same as first stage)	• Sponsoring of seminars and work shops on export markets, production control, etc. for garments (same as first stage) • Sponsoring of seminars on designs and brands (cooperation with DEP)

[Plan in Detail - 3] (continued)

Common Sector	Textile Sector	Garment Sector
Third stage • Full-scale implementation of fee-basis system (testing and inspection, information, training, etc.)	• Equipping of training materials and equipment (looms, computers, etc.) • Engagement of experts for training (weaving, dyeing, etc.) • Start of job training • Start of technical guidance and roving guidance to private companies	• Equipping of training materials and equipment (sewing machines, computers, etc.) • Engagement of experts for training (garment production control) • Start of job training • Strengthening of training, seminars, etc. in local regions • Start of technical guidance and roving guidance to private companies
Fourth stage • Expansion of independent revenue sources • Augmentation of service functions and expansion of services in local regions • Replacement and strengthening of materials and equipment • Securing of instructors • Full-scale start of research and development activities etc.		

[Plan in Detail - 4]

Proposed Equipment List for the Textile Sector of TID

Machine Name	Ranking	Machine Name	Ranking
* Draw Texturing Machine No. 333 (24sp.)	B	* Package Dyeing Machine for Laboratory • High Pressure High Temperature HUHT-250/1000 (1set)	B
* Stretch Breaking Machine for wool, silk or linen OM SILVER REACTER Mdel TR-C5	C	* Hank Dyeing Machine for Laboratory • SOFT-COLOUR HANK DYEING MACHINE SC-S-8	B
* Splicing Knotless Automatic Cone Winder MINI No. 7 R-II (1sp.)	B	* Spray Hank Dyeing Machine for Laboratory NEW-RARE-N-HB (1 cylinder)	B
* Sizing System for filament yarn • Waper: FILAWARPER 450SS • Waper's Beam: FILAWARPER BEAM (6pcs) • Sizer: FILAMASTER EXPERT (1set) • Prebeam: FILAMASTER BEAM (25pcs) • Beamer: FILA BEAMER (1set) • Preparatory Tanks	A	* Polyester Fiber Dyeing Machine for Laboratory • High temperature & High Pressure Dyeing Machine DYEPET SUPER	B
		* Box Dyeing Machine for Laboratory	B
* Air Jet Loom • Air Guid System • Profile Reed type	 B B	* Jet Dyeing Machine for Polyester fabric for Laboratory • High Temperature & High Pressure Dyeing Machine 300 LVPH-M	B
* Water Jet Loom with Dobby 2 nozzle ZW 302	B	* Computer Color Matching System AUCOLOUR 10A	C
* Weaving Control Management System • Computer Monitoring Network System DLM II-D	C, A	* Scanning Microscope JSM-T330A	C
* Color Pattern Design System for dyed yarn • Computer Design Work Station GD 1000 (1set)	C	* X-ray Diffractometer System JDX-8000	C
* Package Dyeing Machine for Laboratory • High Pressure High Temperature HUHT-250/1250 (1set)	B		

Ranking Remarks
A: Equipment recommended to be purchased with aid funds from other countries
B: Equipment recommended to use a method of kease or display or dispose by maker
C: Equipment for training or research

[Plan in Detail - 5]

Draft Concept for Strengthening of Garment Sector by TID

1. Objects
   (1) The object is to provide support to garment manufacturers so as to enable them to timely adapt their production systems to the diversification of consumer preferences in the key markets. In particular, the object is to support the establishment of a production system by garment manufacturers aiming at exports to the small lot, diverse item markets.
   (2) Another object is to support the establishment of a production system by manufacturers aiming at improved nonprice competitiveness.

2. Details of Activities
   (1) Guidance in methods of utilizationof CAD systems
   (2) Guidance in production control technology in accordance with production items and lot sizes
   (3) Dissemination of knowledge on the performance, applications, special features, etc. of various garment producing equipment
   (4) Guidance on the use of computers for production planning, production control, and other work
   (5) Guidance and training of technicians for maintenance of equipment

3. Method of Activities
   (1) Training
   Plans will be made for training of employees of the garment manufacturers of the foreman class up and that training given at the TID. The instructors for the training will be trained from among the TID personnel. Foreign experts should be invited there for that purpose. In the training, the following courses of the following contents will be established. Separate courses, further, will be established for sewn garments and knitted garments.
   a) CAD
      - Lectures on the types, features, and methods of introduction of CAD system etc.
      - On-site training in preparing patterns, grading, and marking by CAD systems

   b) Production control
   - Lectures on process design in accordance with production items and lot sizes, methods of selection of effective equipment, calculation of efficacy of capital investment, layout, process control, schedule planning, and progressive control
   - Lectures on techniques of quality control
   - Lectures on estimates, control of prime costs, etc.
   - Lectures on types, applications, performances, special features, etc. of garment producing equipment
   - Practice in production planning, production control, etc. using personal computers

   c) Maintenance of equipment
   - Lectures on types, applications, performances, special features, etc. of garment producing equipment
   - Lectures on maintenance control techniques for equipment
   - On-site training in maintenance of key production equipment

   (2) Sponsoring of seminars
   Seminars of one to two days' length will be held on specific themes. Consideration will be given to drawing the seminar lecturers from among knowledgeable persons in the Thai garment industry, educational organizations, and government organizations and experts from different countries.

4. Utilization of Existing Buildings
   Space for the following four applications will be secured in the existing buildings of the TID and the necessary equipment and materials will be installed in those spaces:
   (1) Practice area for CAD system
   (2) Practice area for personal computers
   (3) Practice area for maintenance and repair of equipment
   (4) Classroom for 20 to 30 persons

5. Necessary Equipment and Materials

(1) CAD system for sewn garments
- Computer work stations (two to three sets)
- Digitizer
- Plotter
- Application programs (pattern preparation, grading, marking)

(2) CAD system for knitted garments

(3) Personal computers
- Computers and peripherals (five sets)
- Production control and other application programs

(4) Repair and maintenance equipment
- Various tools
- Work tables
- Garment equipment for practice in maintenance

6. Invitaion of Foreign Experts

Foreign experts should be invited to train the TID instructors and give guidance in the preparation of a training curriculum. The foreign experts will witnes the starting stage of implementation of the training courses and will assist the TID instructors at that time. The nature of the guidance, the number of persons dispatched, and the periods dispatched will be as follows:

Nature of guidance	No. of experts	Total term
Operation of CAD system for sewn garments	1	1 month
Operation of CAD system for knitting	1	1 month
Repair and maintenance techniques for equipment	1	3 months
Techniques of production planning and production control and knowledge on garment producing equipment	1	12 months

Further, foreign experts should be invited for short terms as seminar lecturers upon need.

7. Receipt of Trainees

The TID staff who will serve as instructors will be sent to foreign countries as trainees and given the necessary knowledge and guidance on technology. A summary of the program for the trainees is given below:

Nature of guidance	No. of trainees	Term
Techniques of utilization of CAD systems for sewn garments and knitting	2	3 months
Repair and maintenance techniques for equipment and knowledge on garment producing equipment	1	3 months
Production planning and production control techniques and knowledge on garment producing equipment	2	6 months

[Plan in Detail - 6]

Proposed List of Equipment for Garment Production Training Section in TID

Machine name			Unit
<Machinery for garment production>			
OA machinery	Personal computer		10
Machinery for production control	Production control system LEVEL3		1
Machinery for apparel designing	POS, POS terminal		5
<Machinery for apparel made of woven fabric>			
Machinery for designing	Apparel CAD (Computer aided design)		1set
Cloth inspector			1
Cloth analyser		Stepless speed variator	1
Spreading table, machinery	Spreading table	1.8m x 15m	2
	Spreading machine	automatic	1
Cutting machine	Cutting table	1.8m x 3.6m	2
	Cutting machine driven by electric motor with straight cutter	6 inch	5
		7 inch	5
		8 inch	5
	Bandknife	1.8m x 1.6m	1
	Die-cutting press		1
Cloth-drills		with heater	2
Fusing press	Rotary press		1
Sewing machine for industrial use	1-needle lockstitch machine		30
	Overlock machine		30
	Safety stitch machine		30
	Bartacking machine		10
	Zigzag lockstitch machine		3
	2-needle double chainstitch machine		3
	Buttonholing machine		3
	Edge control machine		2
	Serging machine		2
	Eyelet stitch button holing machine		1
	Blind stitch machine		1
	Lockstitch machine with built-in trimming device		1
	2-needle lockstitcher with organized split needle bak		1
	Needle feed lockstitch machine		1
	Covering stitch machine		1
	1 needle bottom & variable top feed lockstitch machine		1
	1 needle top & button feed lockstitch machine		1
	1 needle double chainstitch post-bed type machine		1
	1 needle double chainstitch machine		1
	Automatic lockstitch welting machine		1
	Post-type machine for sleeves		1
	1 needle chainstitch basting machine		1
	1 needle lockstitch post-bed type basting machine		1
	4 needle covering stitch machine		1
Iron	Steam		20
	Electric		10
Vacuum finishing board			30
Press in process	Mini press		3
Collar turning device			3

[Plan in Detail - 6] (continued)

Machine name			Unit
Name cutting and creasing device			3
Finishing press	Sleeve press		1
	Collar press		1
	front press		1
	shoulder press		1
	general utility press		1
Folding machine			1
Bagging machine			1
Truck			10
Special work table for pair sit-work system			30
Special work table for pair stand-work system			30
Hanger system for products warehouse			1
Rack for warehouse			10
<Machinery for sewing knitted goods>			
CAD for knitting			1
Knitting machinery	Horizontal Knitting machine	gauge	1
	Horizontal manual knitting machine		10
	Circular knitting machine	gauge	1
	Vertical knitting machine	gauge	1
Knitted croth inspector	for knitted fabric	1.8m width	1
	for sweaters		1
	for cut & sewn products		1
Linking machine	straight type		5
	dial type		20
Sewing machine for industrial use	1 needle lockstitch machine		30
	1 needle lockstitch machine with automatic thread trimmer		30
	1 needle 3 thread overlock machine		20
	2 needle 4 thread overlock machine		20
Knitted goods, finishing machinery	Iron		10
	Vacuum finishing board		10
	Sweater for knitted goods		3
	Finisher for knitwear		1
<Utilities>			
Electric power			1 set
Power distribution			1 set
Boiler			1
Steam distribution			1 set
Vacuum			1
Duct work			1 set
Compressor			1 set
Compressed air distribution			1
Water supply			1 set
Waste water			1 set
Air conditioning			1 set
Lighting			1 set

Package of Measures [4]

Promotion of Exports of Garments and Improvement of Added Value

A string of export promotion measures for increasing garment exports should be implemented and also the price competitiveness and nonprice competitiveness of the products should be raised through improvement of quality, development of design capabilities, establishment of good brand images, establishment of sales channels, and improvement of the overall image of "Thai fashions". Toward this end, the Ministry of Commerce (DEP) should take the lead and the Ministry of Industry (TID) should cooperate with it for support activities, particularly for small and medium sized companies.

Program [4]

Promotion of Exports of Garments and Improvement of Image

The export promotion activities of the DEP for garments should be energetically promoted so as to get small and medium sized garment manufacturers to enter into the export field and to improve the image of Thai fashions. Toward this end, it would be effective to combine the activities with the training and information functions of the TID and to cooperate in activities for the expansion of exports and improvement of added value.

Export promotion activities considered effective for the DEP for the time being would include sponsoring of export promotion seminars for primarily small and medium garment companies (in particular regarding overseas markets and export channels), participation in overseas trade fairs aimed at small and medium sized manufacturers, sponsoring of overseas exhibitions, and dispatch of export promotion missions. Further, an international exhibition could be sponsored in Thailand for garments and purchasing missions from abroad should be accorded warm receptions. As a means for improving the image of Thai fashions, it would also be effective to obtain the cooperation of the Thai jewelry, silk product, and other industries and hold a "Thai Fashion Week" in major cities around the world.

Other activities of the DEP considered effective include cooperation with the TID for promotion of designs and brands. For this, consideration may be given to, for example, hosting seminars on designs and brands to create awareness in the garment industry of the importance of designs and brands and the hosting of design contests etc. to promote designers. Further, the establishment of a "fashion street" in Bangkok would be effective in the medium and long term in boosting the international image of Thai

fashions. The collection and dissemination of design information are also thought to be important future activities of the DEP and TID.

Package of Measures [5]

Formulation of Image of Future of Textile Industry as a Whole

To create a common concensus in the industry over the future of Thailand's textile industry, opinions should be exchanged with related agencies, industrial organizations, etc. and an image of the Thai textile industry (including garments) five and 10 years hence should be created and widely publicized.

Program [5]

Textile Industry "Vision"

It is essential to formulate an image of the future state of the textile industry so as to draft policies for Thailand's textile and garment industries. Toward this end, a committee comprised of related government agencies, industry representatives, and economists, etc., should be established to formulate the vision, with and the government sections in charge of the textile industry serving as the secretariat.

The vision which is formulated should be publicized, used, through PR activities, for creating a common awareness among the related persons in the industry, and used as the basis for textile industry policies.

Table 7. Comprehensive Program (Textiles and Garments) (1/5)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
Augmentation and modernization of garment material supply sector - To meet with increase of facilities in upstream sector, augmentation and strengthening of midsteam sector in direction of expansion of ability to supply garment materials through establishment of necessary organizations and institutions and formulation and implementation of promotion measures	[1] Augmentation and strengthening of materials supply sector					
	Promotion of investment in weaving and knitting sector					
	- Temporary lifting of restrictions on facilities	Lifting of restrictions	○	○		
	- Revival of application of BOI incentives	Encouragement of investment	○	○		
	- Promotion of investment and joint ventures	Promotion of investment	○	○	○	
	Establishment of environment for investment in dyeing, printing, and finishing sector					
	- Activities to promote awareness of pollution caused by factory wastewater	Seminars	○	○		
	- Feasibility studies on creation of industrial estate for dyeing (joint water supply and wastewater system)	Feasibility studies	○			
	- In the establishment of an industrial estate, designation of that estate as eligible for BOI incentives	Encouragement of investment		○	○	○
	- Similarly, promotion of relocation of existing dyeing companies into estate and measures for encouragement of relocation (low interest government financing, tax abatement measures etc.)	Same as above		○	○	○
	- Similarly, promotion of new investment	Encouragement of investment		○	○	○
	Promotion of modernization of facilities in material supply sector (spinning, weaving and knitting, and dyeing sectors)					
	- Lifting of restrictions on facilities for the case of introduction of facilities aimed at improvement of quality	Elimination of restrictions	○	○	○	○
	- Temporary reduction or waiver of import duties on imports of such related facilities	Abatement of tariffs	○	○	○	
	- Similarly, temporary implementation of special financing system for introduction of such facilities	Special promotion	○	○	○	
	Promotion of converter function					
	- Activities to promote awareness of converter functions	Seminars	○	○		
	- Promotion of investment by foreign companies (in particular, consideration given in issuance of visas)	Promotion of investment	○	○	○	○

Comprehensive Program (Textiles and Garments) (2/5)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
	Stationing of policy advisors in TIDC					
	- Engagement of policy advisors	Engagement of experts	○			
	- Training of policy officers in industrial policies	Overseas training	○	○		
Expansion of production capacity of garments and development of human resources (Promotion of small and medium sized companies and personnel training)	[2] Expansion and strengthening of garment industry					
	Augmentation of textile and garment courses in public vocational schools (training of engineers)					
	- Training of teachers	Overseas training				
	- Practice in production control in model factories (mentioned below)	Practice at factories	○	○	○	
- Strengthening of vocational training so as to expand production capacity in garment sector. Further, stimulation of industry and expansion of supporting industries through promotion of small and medium sized companies and subcontractors					○	○
	Training program for "sewing workers and cutting workers" at institute of skill develpment					
	- Establishment and operation of "model factories" (in Bangkok and local region, each with 100 or so sewing machines and dormitories)	Establishment of model factories			○	○
	- Training of teachers and instructors	Overseas training	○	○	○	
	Promotion of small and medium sized companies and subcontractors					
	- Creation of industrial estate for sewing near above-mentioned "model factory" (one in local region) and provision of incentives to attract companies there	Promotion of investment			○	○
	- Application of SIFO institutional financing	Institutional financing				
	- Temporary abatement of import tariffs on facilities	Abatement of tariffs			○	○
	- Implementation of public leasing system for facilities	Leasing system			○	○
					○	○
	Strengthening of OJT at companies	Engagement of experts				
					○	○

Comprehensive Program (Textiles and Garments) (3/5)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
Augmentation and strengthening of training, testing, and information functions of government organizations - In particular, selective strengthening and use of existing functions of government organizations for retraining of engineers and skilled workers in fields considered urgent, testing and inspection, information supply, etc.	[3] Enlargement, strengthening and use of TID					
	Strengthening of teaching abilities of TID staffers (strengthening of teaching abilities in textile fields aimed at higher level engineers of companies)					
	- Technical training of TID staff	Engagement of experts Overseas training	○	○	○	
	- Provision of facilities for above training	Provision of materials and equipment			○	○
	- Training in production control at "model factories" (above mentioned)	On-site training			○	○
	Establishment of teaching functions in garment production field					
	- Technical training of TID staff	Engagment of experts Overseas training	○	○	○	
	- Provision of facilities for above training	Provision of materials and equipment				
	Sponsoring of seminars and work shops	Engagement of lecturers Sponsoring of seminars	○	○		
	Roving guidance to companies	Engagement of experts			○	○
	Augmentation of testing and inspection functions (tests, analysis, and inspection of quality of materials, products, etc.) - Augmentation of testing and inspection facilities	Provision of materials and equipment		○	○	
	- Training of testing and inspection personnel	Engagement of experts Overseas training	○	○	○	
	Opening of testing and inspection facilities to public on a fee basis (along with guidance on testing and inspection methods by TID)	Private use of facilities		○	○	○

Comprehensive Program (Textiles and Garments) (4/5)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
	Strengthening of information functions					
	- Training of information staff	Engagement of experts	O			
		Overseas training	O			
	- Publication of textile information journal (fee basis) (publishing results of tests and analysis etc.)	Publication of information journal		O	O	O
	- Creation of cooperative system with DEP, industrial organizations, etc.	Consultations with related organizations	O			
	Introduction of principle of beneficiaries paying for services					
	- Establishment of fee-basis service system	Introduction of fee-basis services		O	O	O
	- Stationing of organizational advisors	Engagement of experts	O	O	O	
Promotion of exports of garments and improvement of added value - Expansion of exports of garments and further increase of added value and nonprice competitiveness through development of design capabilities, establishment of brand images, establishment of sales channels, and further improvement of image of Thai fashions through the cooperation and support of the Ministry of Commerce (DEP) and the Ministry of Industry (TID)	[4] Promotion of exports of garments and improvement of image					
	Export promotion activities of DEP					
	- Export promotion seminars and market seminars	Sponsoring of seminars				
	- Dispatch of export promotion missions	Dispatch of missions	O	O		
	- Receipt of purchasing missions	Receipt of missions	O	O	O	O
	- Marketing surveys of key markets	Market surveys	O	O	O	O
	- Participation in overseas trade fairs and exhibitions	Participation in trade fairs	O	O	O	O
	- Sponsoring of Thai fashion week in key markets	Sponsoring of events	O	O	O	O
	- Sponsoring of export trade fair in Thailand	Sponsoring of trade fairs		O	O	O
				O	O	O
	Promotion of designs and brands (through cooperation of DEP/TID)					
	- Promotion of awareness importance of designs and brands	Sponsoring of seminars				
	- Training of designers	Overseas training	O	O		
	- Collection and supply of design information	Information service	O	O	O	O
	- Sponsoring of design contest	Sponsoring of events		O	O	O
	- Creation of "fashion street"	Establishment of forum		O	O	O
				O	O	

Comprehensive Program (Textiles and Garments) (5/5)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
Formulation of desired future image of textile industry - Formation of common perception in industry as to future of Thai textile industry	[5] Textile industry "Vision" - Active use of policy advisors (mentioned earlier) - Creation of forum for exchange of opinions among related persons - PR activities for "vision"	Active use of experts Establishment of forum PR activities	O O	O O O	 O	

3-1-3. Examination of Priorities of Programs

The priorities of the programs in the textile and garment sectors were studied based on the standards of evaluation shown in Table 9.

The program for augmentation and strengthening of the materials supply sector of [1] includes numerous measures realizable by institutional means such as the lifting off restrictions on facilities, the application of BOI incentives, and the abatement of duties and therefore could be quickly realized through political judgement and action, it is believed. This is further judged to be highly urgent in view of the expansion of the upstream sector.

The augmentation of the dyeing, printing, and finishing sectors has as a prerequisite measures to deal with the problems of water supply and wastewater, so a feasibility study should be run as quickly as possible on the establishment of an industrial estate for the dyeing sector. The augmentation of these sectors is urgent and important for the growth of the Thai garment industry. IIf one considers the feasibility study and the ensuing construction and promotion of investment there by companies, at the very least the feasibility study should be commenced immediately.

Note that in planning the industrial estate for dyeing, there should be room for consideration of a larger scale estate including other industries with similar water supply and wastewater problems.

The program for promotion of converter functions must be run in parallel with the publicization among domestic distributors and related businesses and the transfer of soft technology (knowhow) from foreign businesse and must be run with a medium and long term perspective. It should be understood that there are no means available having immediate effect.

In realizing this array of programs, the engagement of a policy advisor having experience in textile industry policies for a one year period would be very effective. At the same time, it is urgent to establish a section in charge of drafting and realizing the future textile industry policies and train the staff to man it.

The augmentation and strengthening of the garment industry of [2] is a program developed after consideration of numerous factors such as global trade friction, changes in exchange rates, relocation of production centers, etc. plus the rapid rise in garment exports from Thailand, the existence of a surplus labor force in the local regions of Thailand, and the need for promotion of local industry. In view of these factors, the program is expected to have numerous, immediate effects, such as:

- the maximum use of changes for expansion of exports
- a direct tie-in between the use of the surplus labor force (in particular in the local regions) and expanded exports
- local dispersion of industry
- the general raising of the level of skills among workers.

This program is judged to be extremely realistic and realizable in terms of the medium and long term development of the garment industry and the resolution of problems in the national economy.

The program for establishment of model sewing factories in the Institute for Skill Development is aimed at quickly training skilled sewing, cutting, and other workers and at the same time training engineers for production control and process control. Production control and process control technology is a field which the many small and medium sized companies which have entered the export field must quickly master. The use of such model factories for the technical training at vocational schools and the TID would, it is believed, be tremendously effective.

The biggest obstacle to this program is probably the securing of the required instructors. In this regard, there is no choice be to deal with the problem by assembly manpower from a wide spectrum of society, including skilled workers and engineers who have already accumulated considerable experience in private companies.

The augmentation, strengthening, and use of the TID of [3] is judged to be another urgent and important program in view of the the rapid growth of both the Thai textile and garment industries and the low degree of maturity of their technology and knowhow. At that time, it will be absolutely necessary in view of the manner of development of the Thai textile industry to introduce the principle of the beneficiaries paying for services, even if support can be expected from the outside for the time being. The provision of the services desired by the private companies and the request for them to bear the expenses of the same are essential for invigorating this organization.

In augmenting the TID in this way, it would probably be effective and necessary to engage for a period of three years or so an organizational advisor with experience in running this type of organization.

The promotion of garment exports and the improvement of image of [4] is also an important program. In this regard, the DEP already has considerable experience and has sufficient abilities in planning and execution, it is judged. The problem lies in deepening the understanding among the related agencies and industries of the necessity of raising the

added value of garments and improving the image of Thai fashions. If this can be achieved, then the realization of the program should not be that difficult.

The textile industry "vision" of [5] is a means for encouraging industry to develop in a desired direction while loosening government controls. If it were possible to create a "certain degree" of a common image among related agencies and industries of the Thai textile industry five to 10 years from now, a very effective foundation would be laid for realization of industrial policies, the activities of public service organizations, and cooperation between government and the private sector. However, the "vision" should be formulated through a concensus of the related parties and thus should not be hurried.

Table 8. Examination of Priorities of Programs (Textiles and Garments)

	Program	Existence of official promotional organization	Necessity for augmentation or establishment of same	Size of required funds	Possibility of securement of required personnel	Magnitude of direct effects	Urgency of implementation of program	Necessity of outside support	Possibility of realization of support	Evaluation of priority
[1]	Augmentation and strengthening of materials supply sector of garments	No (industrial estate for dyeing)	Establishment needed (industrial estate for dyeing)	Large (industrial estate for dyeing)	High (policy advisors)	Large	High	Large (feasibility study for industrial estate for dyeing)	High (policy advisors, feasibility study)	A
[2]	Expansion and strengthening of garment industry	No	Establishment needed (training center, TID)	Moderate (training center, TID)	Moderate (instructors)	Large	High	Large	Moderate degree (partial)	A
[3]	Enlargement, strengthening, and use of TID	Yes (TID)	Augmentation (training, inspection, and information functions)	Large	Moderate degree (instructors)	Large	High	Large	Moderate degree (partial)	A
[4]	Promotion of exports of garments and improvement of image	Yes (DEP)	Augmentation	Small	Not particularly required	Moderate degree	Moderate degree	Moderate	Moderate degree (partial)	B
[5]	Textile industry vision	Yes (TIDC)	Establishment of committee	Small	High (policy advisors)	Large in medium and log term	Moderate degree	Small (not particularly required)		B

3-2. Wooden Furniture Industry

3-2-1. Basic Strategy

As the basic strategy for the development and expansion of the wooden furniture industry of Thailand, consideration may be given to the following framework of measures:

(1) Since it is no longer possible to harvest domestic wood resources, except from the rubber tree, securing of a stable supply of logs and lumber should be stressed as a basic policy for the survival of the wooden furniture industry. Toward this end, the maintenance of smooth economic and trade ties with nearby countries and the promotion of investment by Thai companies (in particular lumber companies) in nearby countries as much as possible so as to secure imports of logs and lumber will be essential. Further, promotion of research and development in technology for creating lumber from domestic rubber trees, improvement of the quality of parawood, and standardization of quality will be important. The government should do the most it can in this regard.

(2) For the most effective utilization of the limited supply of wood resources, it will be necessary to maximum the degree of processing and added value of wooden products. Conversely, exports of wood products with low degrees of processing should be suppressed. There is a considerable margin for raising the degree of processing and added value of export-oriented wooden furniture and therefore means should be devised for promoting this throughout the large corporations and the small and medium sized companies. In this regard, promotion of joint ventures and technical tieups with foreign companies which have advanced technology and sales capabilities would be effective.

(3) In promoting the export-oriented wooden furniture industry, it will be essential to raise the level of the small and medium sized companies - both those companies which have begun exports and those which have not. Toward this end, it will be necessary to improve the conditions under which these small and medium sized companies procure logs and lumber and to promote the modernization of the facilities of these small and medium sized companies and further to raise their design and processing skills. For this, promotion of joint ventures and tieups with foreign companies and also strengthening and use of the job training functions of the FIDC would be effective.

(4) The FIDC, along with this basic strategy, should strengthen its functions, in particular its training in design and processing technology, guidance, testing and

inspection of products, and collection and dissemination of information and further should strengthen its services to private companies (in particular small and medium sized wooden furniture manufacturers) through the introduction of the principle of the beneficiaries paying for services. Further, apart from the above, research and development of technology for processing parawood for wooden furniture use should be promoted through cooperation with related organizations.

3-2-2. Comprehensive Program

Package of Measures [1]

Augmentation and Strengthening of Job Training, Inspection, Information, and Research and Development Functions of Government Organizations

In particular, with the aim of raising the degree of processing and added value of small and medium sized furniture manufacturers, the service functions of the Furniture Industry Development Center (FIDC), the existing promotional organization in the ISI of the Ministry of Industry, should be strengthened and put to good use. As the service functions, stress should be placed on job training, product testing and inspection, and dissemination of information. Further, the principle of the beneficiaries paying for the services should be introduced so as to invigorate the organization. In addition, research and development should be carried out on the technology for production of parawood from felled rubber trees, in particular with the aim of improving the quality of furniture materials.

Program [1]

Augmentation and Strengthening of FIDC

To finance the strengthening of the functions of the FIDC, the prerequisite is the introduction of the principle of the beneficiaries paying for services and, through this, the revitalization of the organization. In this regard, it will be necessary to establish and put into practice a fee-basis system for the training, testing, and information services and further to establish a system of cooperation with the furniture industry association. For the formulation and realization of such systems, proposal would like to be made of the engagement of an organizational specialist for about one year (for reference: Plan in Detail - 1).

As the service functions of the FIDC, it will be first of all important to improve and put to use the job training function. This will require the training of instructors through overseas training of FIDC staff and engagement of experts. Along with this, the FIDC's training equipment will have to be replaced or augmented. (For the equipment presently owned by the FIDC, see Table III-2-1 and Table III-2-2.For equipment which requires additions, refer to Plan(s) in Detail 2 and 3.) Further, regarding job training at the FIDC, consideration should be given to use of engineers from the private sector so as to make up for the shortage of instructors.

Similarly, the testing and testing function should be improved and put to use. In this regard too, augmentation of testing equipment and training of testers will be needed.

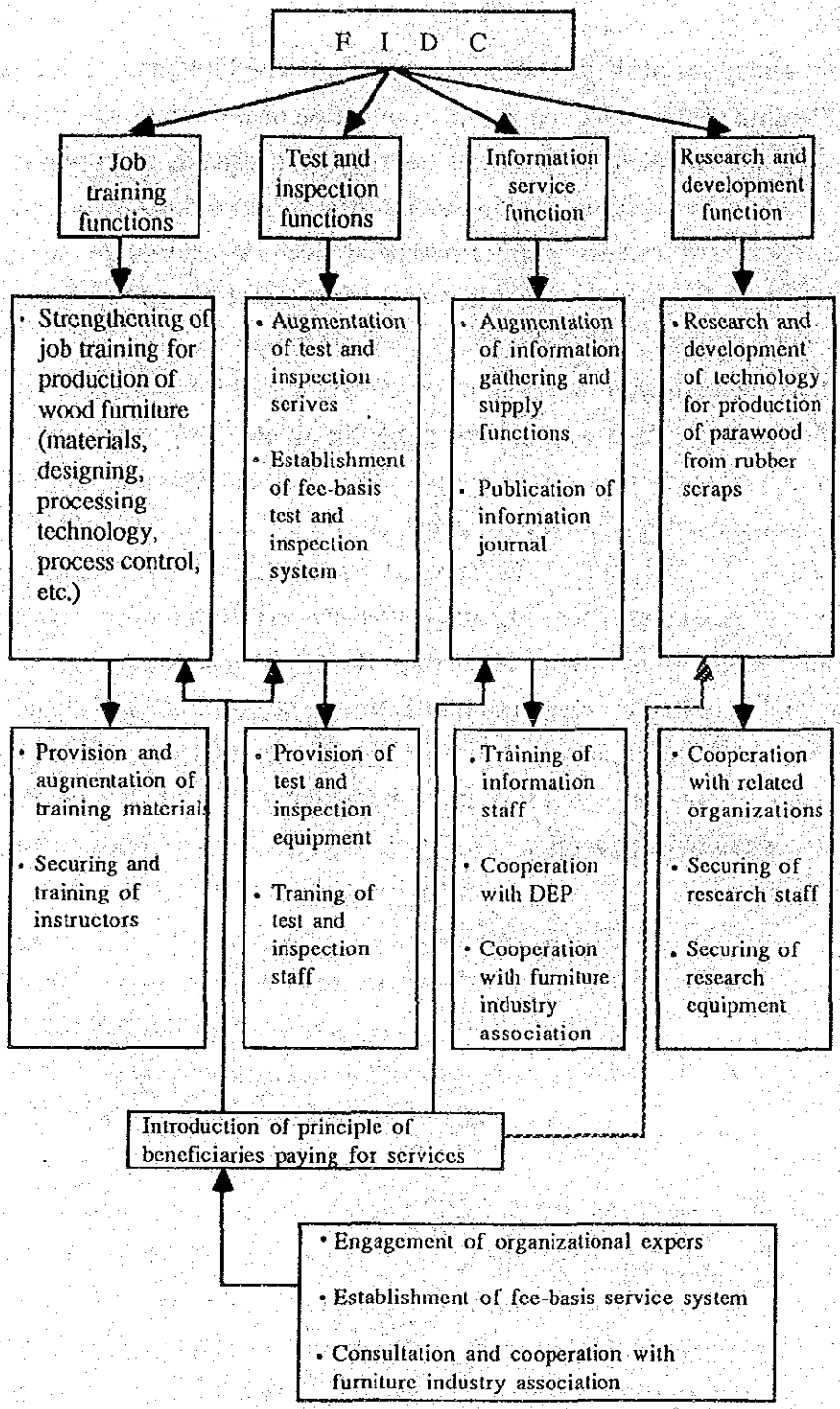
Dispatch of staff overseas for training or engagement of outside experts would again be necessary for this.

Among the functions of the FIDC, stress should also be laid on the information function. Strengthening of the collection and dissemination of information is necessary not only for raising the technical level of the industry, but also for strengthening of product development and marketing etc. Publication of a furniture information journal could be an effective means for such an information service. Stronger cooperation with the DEP and industrial organizations would also be important for strengthening the information activities.

In relation to the training, testing, and information functions mentioned above, the FIDC would find it effective to host seminars, work shops, etc. for private companies. More specifically, these could be run on the themes of production technology for wooden furniture, designing, the overseas furniture markets, etc.

Also, as another function of the FIDC, proposal would like to be made of research and development of the technology for production of parawood from rubber trees. In this regard, a cooperative relationship with related organizations with past experience in this is considered essential, but from the viewpoint of the furniture manufacturers of the need for a stable supply of good quality materials, the FIDC could take the lead in research and development, obtaining cooperation from the furniture industry associations and furniture manufacturers, and make public announcement of its findings so as to promote progress in the industry as a whole.

Chart 12. Program of Augmentation and Strengthening of FIDC



[Plan in Detail - 1]

Draft Step-by-Step Schedule for Augmentation and Strengthening of FIDC

FIDC	Related Organizations
First stage • Engagement of organizational and project advisors • Preparation draft of plan for augmentation and strengthening • Overseas training of FIDC staff (technical guidance personnel, inspection personnel, and information staff) • Preparation of detailed draft for introduction of principle of beneficiaries paying for services (fee-basis service system) • Sponsoring of seminars and work shops on overseas furniture markets, production technology, industrial and aesthetic design, etc. • Examination and deliberations of cooperative system, basic plans, etc. relating to research and development of parawood production technology	• Deliberations with furniture industry association • Deliberations with furniture industry association • Seeking of cooperation from DEP and furniture industry association and seeking of participation of private small and medium sized companies • Exchange of opinions and deliberations with furniture industry association, Royal Forest Department, etc. (• Export promotion activities of the DEP)
Second stage • Equipping of testing and inspection materials and equipment • Open to public testing and inspection functions on fee basis • Publication of furniture information journal (fee basis) • Sponsoring of seminars and work shops on overseas furniture markets, production technology, industrial; and aesthetic design, etc.	• Establishment of cooperative system with furniture industry association, DEP, Royal Forest Department, etc. regarding testing and inspection services and information service (• Promotion of joint operations of small and medium size companies) (• Promotion of tieups and joint ventures with foreign companies) (• Continuation of export promotion activities of DEP)
Third stage • Augmentation and equipping of training and guidance materials and equipment • Sponsoring of training and work shops on fee basis • Start of roving guidance to companies • Equipping of materials and equipment and securement of staff for research and development of parawood production technology • Start of same research and development activities	• Strengthening of cooperative system with furniture industry association • Same as above • Cooperation of related organizations and furniture industry association

[Plan in Detail - 2]

Processing Equipment Requiring Replacement or Augmentation at FIDC

Equipment	Specifications	
Straight line rip saw	Max. saw dia.	255-355mm
	Spindle revolution	4,000/5,000rpm
	Feed speed	15-30m/min. (Step less)
	Distance from saw to column	510mm
	Mix thickness of work	80mm
	Distance among pressure rolls	170mm
	Table area	1,600mmx1,000mm
	Overall height, width, depth	1,450mmx1,490mmx1,775mm
	Motors for saw	5.5KW (380V, 50Hz, 3ø)
	for feed	1.5KW (380V, 50Hz, 3ø)
Auto level-planing double side planer	Max. stock width	300mm
	Max. stock thickness	100mm
	Cutter head, round type	3 knives
	Cutting circle	108mm
	Cutter head speed	5,000rpm
High speed tilted saw type	Max. circular saw dia.	405mm
	Hole dia. of circular saw	25.4mm
	Max. Thickness of workpiece	135mm
Four spindle single and tenoner	Max. tenon length	100mm
	Max. tenon width	330mm
	Max. stock width	76mm
	Max. diam. of circular saw	300mm
	Hole diam. of circular saw	25.4mm
Hollow chisel mortisor (Hydaulic)	Chisel size	6-24mm
	Max. effective thickness & width	170mmx150mm
	Drill chuck (No.3 Morse taper)	16mm
	Vertical taravel of chisel	125mm
Conner locking machine	Max. effective with	450mm
	Max. effective thickness	120mm
	Max. effective depth of fret	38mm
	Fret pitch	5.75mm
	Spindle speed	2,850rpm
Auto doverailing machine	Max. effective thickness	10-25mm
	Max. effective width	210mm
	Number of bit	8pcs
	Spindle speed	10,000rpm
	Pitch of bits	25mm
Auto single surface planer	Thickness range 6-320mm	
	Cutter spindle speed	4,500rpm
	Cutter spindle	127ø with 3 knives
	Feeding speed	4-22m/min (stepless)
	Max. planing width	450mm
High-frequecy heater	High frequecy output	3KW (380V, 50Hz, 3ø)
	Total input	7KVA (380V, 50Hz, 3ø)
	Frequency (approx. 1)	6.7MHz
	Dimensions	800mmx750mmx1,720mm
Boring machine	Width of work 640mm	
	Length of work 1,350mm	
	Thickness of work	45mm
	Drill head	21 spindles of 30P
	Motor	1.5KW (380V, 50Hz, 3ø)
Wide belt sander	Max. working width of stock	1,270mm
	Max. working thickness of stock	200mm
	Feed speed, infinitely variable by inverter control	5-30m/min
	Width and length of abrasive belt	1,310mmx2,615mm
Double head polley sander	Spindle diameter 25.4mm	
	Spindle speed	1,000/1,660rpm
	Motor	400W
	Table area	750mmx750mm
	Table height (adjustable)	680-720mm

KT combination boiler	Fire tube, water tube boiler	
	Dia. of shell	750mmx1,650mm
	Max. working pressure	10Kg/cm^2
	Surface area	8.0m
	Evaporation	rated 280Kg/H
Solid woodbend machine	Material & size	Pararubberwood 25-50mm thickness 50-75mm width 1500mm length (max.)
	Bending angle	Single, as smaller as possible
Finger jointing equipment	Micro-computer controlled length-cut system Handling stock 15-50mm thick, 30-220mm wide and 200-2,000mm long. With finger sharper, automatic feeder, finger joint, assembler, cutter grinder.	
N.C.Router	Router machine with 4 Spindle heads:	
	Router head :	5KW(2P) 2 Spindle heads
	Router/Molder heads:	2 Spindle heads: 5KW (2/4P)
	Voltage	380V, 3-phese, 50Hz.,
	Table area	1,300mmx2,000mm
	Stroke	1,300Xmm, 2,000Ymm, 250 (Z Axis)mm
Electrostatic spray set	Kind of paint	General paint (Metalic, Waterbse, Conductive)
	Max. pattern width	330-390mm
Ultraviolet drying machine	Input voltage	AC220V, 1 phase
	Feed speed	1.5-5m/min
	Effective irradiation width	200mm
	Lamp	HI-20(N), 2,000Wx1pc
Copy turning lathe	Max. length for machining	800mm
	Max. diameter for machining	70mm
	Follow rest	3 follow rest sizes
Multiple spindle boring	Max. effective length	250-2,000m
	Effective width 100-600mm	
	Pitch between spindles	30 or 32mm
	Horizontal spindle	20 Spindles in a row, at both ends
	Vertical spindle	5 rows, 20 spindle per row
Six spindle moulder (4-side moulder)	Max. size to be processed	180Wx180mmH
	Min. size to be processed	18Wx12Hx500mmL
	Dia. of cutter head	120mm
	No. of cutting kinves	4pcs.
Electric dry kiln	Forced-air-circulation Internal fan type	
	Capacity	1.11m3
	Max. piling up dimensions	2,000Lx1,200Wx1,200mmH
Top side grinder for tipped saw blade with TCT knife grinding machine	Max. effective diameter of saw	405mm-16"
	Max. effective diameter of cutter	305mm-12"
	Max. effective shank of bit	0-13mmø
	Max. size of knife to be ground	120mm
	Size of diamond wheel	150mmø
Spray booth	Water wash spray booth Main body dimensions (WxDxH) 4,000Wx2,000 (Water tank 1,500)Dx2,565mmH	

[Plan in Detail - 3]

Additional Testing Equipment Required at FIDC

Equipment	Specifications	
Equipment for temperature and humidity control room	Room No. 1 (condition test) Test condition Test period Room No. 2 (condition control) Test condition Test period	3m(W)x 5m(D) x 4m(H) 25°C, 65% RH (Constant) 7 days 2m(W) x 3m(D) x 4m(H) 15-60°C, 30-95% RH (Adjustable) 3 days
Elastic loop dynamo meter (Load calibrator)	Max. cap. Min. cap.	150Kg 15kg
Straine gauge (Load cell) with recorder	With Load cell, Dynamic straib amplifier, 3 Channel recorder, Displacement transducer	
Sponge compression tester (Foam hardness check test machine)	Capacity	8Kg
Surface gauge Profilemeter (Roughness meter) with recorder	Traversing length Straightness accuracy	1-30mm 0.5micron/30mm
Rockwell hardness tester	Minor load Major load Vertical gap Horizontal reach	10Kg 60,100,150Kg 200mm 135mm
Computer aid design (CAD)	1set	
Weather meter	Light source Temperature Humidity	6KW water-cooled xeanon long-life arc lamp Room temp. +15~60°C 30~60%RH (at 40°C)
Wood cutting torque and speed measuring machine	For wood cutting experiment, ie. Minimum piece size	Pararubberwood, monkey pot, etc. 30mm(W) x 10mm(T) x 200mm(L)
Universal testing machine (Tensile and compressive testing machine with recorder)	Load range Effective distance between frames Crosshead stroke	1,000Kgf 420mm 1,100mm
Precision gas detector (Free formaldehide meter)	With Absorber Detection tube Disposal type 1,000 pcs	
Gross meter	Measuring surface Incident angle	14x45mm Light emitter (0-85°C) Light-receiving element (0-85°C)
Profile projector (Universal projector)	Screen dia.	350mm
Vibration testing machine	Max. loading weight Direction of vibration Vibration table	150Kg Vericall 1,000Wmmx1,000Dmm
Caster tester	Size Running speed Installation	Approx. 900Wmmx900Dmmx900Hmm Approx. 800m/min Approx. 1m
Scratch hardness tester (Fabric flex tester)	Load max.	50gf
Taber abrasion tester	Revolution Load	60± 2rpm 250g, 500g, 1,000g
Equipment for chemical laboratory	Kind of analysis	Wood preservative substances Lacquer, paint, stain and bleaching agents Adhesive and free formaldehide

Joinery tester	Size	Approx. 1,600Wmmx1,250Dmmx2,250Hm
	Open and close speed	10±1/min
	Open angle	70° ± 5°
	Door for test	900Wmmx2,000Hmm
Cabinet door closs and open tester	Size (Frame)	1,200Wmmx1,000Dmmx1,500Hmm
	Stroke	400mm
	Repeat speed	20 times/min
Bed tester	Size	Approx. 2,500Wmmx1,700Dmmx1,500Hmm
	Stroke	200mm
	Repeat speed	160 ± 10 times/min
Flamability furniture test instruments (Cabinet and equipments for flamability test)	Test specimin	300mmx300mmx70mm
	Heating part	Burner (Automatic sliding method)
	Control pannel	
	Heating time determination	0-99min. 99sec.
	Remains of flame time determination	0-999.9sec.
	Remains of soot time determination	0-999.9sec.
	Size	
	Control panel	52Wcmx25Dcmx50Hcm
	Test part	75Wmmx83Dmmx94Hcm
Autoclave	Usable inner size	400øx650mm (82 L)
Dyeing abrasion tester (Fabric rubbing meter)	Number of test specimim	6 pcs.
	Size of test specimim	30Wmmx220Imm
Micrometer	Range	0-25mm 25-50mm 50-75mm 75-100mm
Fatigue and static load chair test machine	Size (base)	1,500Wmmx1,500Dmm
	Repeat speed	1-20 times/min

Package of Measures [2]

Promotion of Small and Medium Sized Companies and Raising of Level of Same

The shortage in domestic wood resources has placed the small and medium sized wooden furniture manufacturers in a more difficult position than the large corporations in the procurement of materials. Further, the small and medium sized companies are suffering from the serious problems of out-dated equipment and a lack of specialized machinery. To improve the situation, measures should be devised through cooperation of the government and related organizations. In addition, there are problems in design and processing technology, but resolution of these problems should be left to the FIDC, as discussed earlier.

Program [2]

Raising of Level of Small and Medium Sized Companies

To raise the level of small and medium sized furniture manufacturers, first of all it will be important to secure stable supplies of wood. For this, government support is hoped for in areas such as the promotion of imports of logs and lumber from nearby countries and the promotion of the investment of lumber businesses in those nearby countries. Proposal would like to be made, as more specific means, of the joint import of wood by small and medium sized furniture manufacturers and the establishment of joint lumber mills and joint drying factories by the same. In relation to this, examination should be given to application of BOI incentives, access to institutional financing, etc. and these realized as much as possible.

Next, it will be important to replace and modernize the machinery and equipment of small and medium sized furniture manufacturers. In this regard, temporary abatement of import duties on related machinery and equipment, access to institutional financing, and the like would be effective

Package of Measures [3]

Improvement of Added Value and Degree of Processing and Export Promotion

Related government agencies should cooperate and provide support to improve the added value and degree of processing of exported wooden furniture and to increase exports. In particular, the functions of the Department of Commerce (DEP), BOI, and DIP (FIDC) should be combined and used so as to promote investment, the improvement of the level of production of small and medium sized furniture manufacturers, and the expansion of exports.

Program [3]

Promotion of Joint Ventures and Tieups and Promotion of Exports

For the promotion of investment, it would first of all be effective to promote joint ventures and tieups with foreign companies through the activities of the BOI and DEP. At that time, it is considered essential to provide sufficient information on the current state and future prospects of procurement of materials in Thailand. The dispatch and receipt of missions for this could also be expected to be effective. In particular, the promotion of technical tieups (including consignment production) with foreign furniture manufacturers would be an effective means for the time being for companies to enter into the export field.

For the promotion of exports, proposal is made of augmentation of the export promotion abilities of the DEP for furniture. In particular, for the small and medium sized furniture manufacturers and companies with little export experience, the participation in overseas furniture trade fairs, dispatch of export missions, and arrangement of tieups with foreign companies would be important. Further, sponsoring of furniture trade fairs in Bangkok, establishment of a standing exhibition center for furniture (costs borne by the beneficiaries), etc. could be effective means.

Package of Measures [4]

Development of Human Resources for Woodworking and Furniture Production

Woodworking related courses at vocational schools, job training centers, etc. should be augmented and tied in to improvements in the degree of processing and added value.

Program [4]

Augmentation of Vocational Education and Training

To realize the above-mentioned improvement in the degree of processing and added value (including for small and medium sized companies), the woodworking and furniture courses at the vocational schools and Institute for Skill Development (ISD) must be augmented. The prerequisite for this would be the securing of practical training functions at the educational and training institutions and securing of instructors for the same. In particular, use of experts in the private sector and active use of on-the-job training at the corporate level would be important.

Package of Measures [5]

Establishment of System for Stable Acquisition of Materials

A system should be established, through deliberation and cooperation among related government organizations and industry, so as to promote the stable acquisition of materials.

Program [5]

Measures for Securing Materials

To ensure stable imports of logs and lumber from nearby countries etc., friendly governmental relations should be maintained and investment of lumber businesses should be promoted in the nearby countries. Further, research and development of technology for the production of parawood for furniture use, through utilization of waste in the rubber industry, should be promoted through cooperation with the FIDC and related organizations.

Table 9. Comprehensive Program (Wooden Furniture) (1/3)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
Augmentation and strengthening of training, testing, information, and research and development functions of government organizations - In particular, strengthening and use of functions of existing government organization, FIDC (Furniture Industry Development Center) in ISI of Ministry of Industry, aimed at raising degree of processing and added value of small and medium sized furniture manufacturers	[1] Augmentation and strengthening of FIDC					
	Strengthening of teaching abilities of FIDC staff (strengthening of teaching abilities aimed at higher level engineers of companies)					
	- Technical training of FIDC staff	Engagement of experts		○	○	○
		Overseas training	○	○	○	
	- Augmentation of facilities for above training	Provision of materials and equipment			○	○
	Sponsoring of seminars and work shops	Engagement of lecturers	○	○		
		Sponsoring of seminars	○	○		
	Roving guidance to companies	Engagement of experts			○	○
	Augmentation of testing and inspection functions (tests, analysis, and inspection of quality)					
	- Equipping of testing and inspection facilities	Equipping of materials and equipment			○	○
	- Training of testing and inspection personnel	Engagement of experts		○	○	○
		Overseas training	○	○		
	Opening of testing and inspection facilities to public on a fee basis (along with guidance on testing and inspection methods by FIDC)	Private use of facilities			○	○
	Research and development of parawood manufacturing technology					
	- Research and development project into chemical treatment technology through cooperation among FIDC, related organizations, and industry	Joint research		○	○	○
		Equipping of materials and equipment		○	○	
	- Dissemination and joint utilization of results	Active use of results	○	○	○	

Comprehensive Program (Wooden Furniture) (2/3)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
	Strengthening of information functions					
	- Training of information staff	Engagement of experts	○			
		Overseas training	○			
	- Publication of furniture information journal (fee basis) (publishing results of tests and analysis etc.)	Publication of information journal		○	○	○
	- Creation of cooperative system with DEP, industrial organizations, etc.	Consultations with related organizations	○			
	Introduction of principle of beneficiaries paying for services					
	- Establishment of fee-basis service system	Introduction of fee-basis services		○	○	○
	- Stationing of organizational and business advisors	Engagement of experts	○	○	○	
Promotion and improvement of level of small and medium sized companies - Expanding and stimulation of furniture industry through support measures for weak small and medium sized companies in the areas of securement of materials and facilities and improvement of the level of the same	[2] Raising of level of small and medium sized companies					
	Promotion of cooperative activities by small and medium sized furniture companies					
	- Joint purchasing of lumber	Joint purchasing	○	○	○	○
	- Establishment of joint lumber mills and joint drying facilities	Joint factories		○	○	○
	- Application of BOI incentives to above	Encouragement of investment		○	○	○
	- Application of SIFO institutional financing to above	Special financing		○	○	○
	Promotion of modernization of facilities of small and medium sized furniture companies					
	- Temporary abatement of import duties on machinery and equipment	Abatement of tariffs		○	○	○
	- Temporary implementation of special financing system	Special financing		○	○	○
Improvement of added value and degree of processing and promotion of exports - Improvement of added value and degree of processing of	[3] Promotion of joint ventures and tieups and promotion of exports					
	Promotion of tieups with foreign companies	Joint ventures and tieups	○	○	○	

Comprehensive Program (Wooden Furniture) (3/3)

Package of Measures	Program	Implementation Method and Schedule				
		Method	1st stage	2nd stage	3rd stage	4th stage/on
exported wooden furniture and expansion of exports through cooperation and support by related government organizations	Export promotion activities of DEP					
	- Export promotion seminars and market seminars	Seminars	○	○		
	- Dispatch of export promotion missions	Dispatch of missions	○	○		
	- Receipt of purchasing missions	Receipt of missions	○	○	○	
	- Marketing surveys of key markets	Market surveys	○	○	○	
	- Participation in overseas trade fairs and exhibitions	Participation in trade fairs	○	○	○	○
	- Sponsoring of export furniture trade fair in Thailand	Sponsoring of trade fairs		○	○	○
	- Establishment of standing exhibition of export furniture (introduction of system of beneficiaries paying for services)	Establishment of exhibition hall		○	○	○
	FIDC information activities (mentioned above)	Publication of information journal		○	○	○
Training of personnel in wooden furniture and furniture production - Augmentation of woodworking related courses in vocational training schools etc. and tying in of same with improvement of degree of processing and added value	[4] Augmentation of vocational education and training					
	Augmentation of woodworking and furniture courses in public specialized schools (training of higher level engineers)					
	- Training of teachers	Overseas training	○	○	○	
	Augmentation of woodworking courses in institute of skill development					
	- Training of teachers	Overseas training	○	○	○	
	Strengthening of OJT in companies	Receipt of experts			○	○
Establishment of system for stable acquisition of materials	[5] Measures for securing					
	Measures for stabilization of imports of logs and lumber					
	- Political measures for stabilization of supply					
	- Promotion of investment of lumbering businesses in countries of supply	Promotion of corporate investment	○	○	○	○
	- Development of parawood manufacturing technology (mentioned before)	Joint research		○	○	○

3-2-3. Examination of Priorities of Programs

The priorities of the programs in the wooden furniture sector were studied based on the standards of evaluation shown in Table 10.

The program of augmentation and strengthening of the FIDC of [1] comprises primarily the augmentation of training and testing functions to raise the degree of processing and added value of products of small and medium sized furniture manufacturers. In promoting the development of the wooden furniture industry, which has limitations in the supply of raw materials, as an export industry, this program is judged extremely urgent and important for the reason that it is considered the only measure available.

In relation with this, the introduction of the principle of the beneficiaries paying for the services of the FIDC so as to place the services on a fee basis and the use of the revenue from the same for help in improving equipment and services are similarly important. It is considered that the FIDC cannot be revitalized without this being done.

Research and develoment of technology for the production of parawood, which is included in the FIDC program, should be promoted so as to focus on and accelerate the effective utilization of rubber trees, in particular improvements in furniture materials, an area which is already being developed by Thailand in view of the global problem of shrinking forest resources. This can be done by consigning research and development to suitable organizations or launching a joint research and development project among related organizations. There are several options available. Whatever is chosen, it will be important to give consideration to the needs of the furniture manufacturers and to maintain cooperative ties with related organizations with experience in the field.

In the medium and long term, technology for the utilization of rubber trees should be established and hopefully put to use on an international level.

The program of improvement of the level of small and medium sized companies of [2] is aimed at the improvement of the export capabilities of small and medium sized furniture manufacturers and particularly has as its objects the improvement of conditions of procurement of materials and promotion of modernization of facilities. Whatever the case, realization of this program is considered relatively easy through institutional means.

In particular, promotion of joint operations may not seem a method too suited to Thai industry by nature, but it has been proven to be effective in many cases for the development of small and medium sized companies in other countries. It is considered that there are full possibilities for it working well in Thailand as well depending on how it

is tailored to the local situation and how it is organized. If success can be achieved in even one case, this should have a ripple effect and causing similar "joint operations" around it.

The program of promotion of joint ventures and tieups of [3] hopefully will be effective in promoting the development of export markets by the small and medium sized companies. The designs of wooden furniture differ depending on the target market and for this reason alone it would be extremely effective for small and medium sized furniture manufacturers to have joint ventures or tieups with foreign companies in developing export markets. In parallel with this, effort should be made to "sell" Thai furniture around the world. The DEP should go one step beyond its previous stance of opening the door to exports and should pour effort into activities for the promotion of exports through parallel improvement of the degree of processing, added value, and image of Thai products.

The augmentation of vocational education and training of [4] aims at strengthening the development of human resources through the vocational schools and Institute for Skill Development. Woodworking will be an important field in Thailand for many years. The expansion of educational and training capabilities in that field, at the local level as well, would not be wasted, if only for the reason that it would be effective in raising the average level of job skills.

The support for securing materials of [5] means effectively maintenance of friendly relations with nearby countries and promotion of investment in those countries by related companies. The Thai government is already moving in that direction, so it is sufficient that this direction be maintained.

Table 10. Examination of Priorities of Programs (Wooden Furniture)

Program	Existence of official promotional organization	Necessity for augmentation or establishment of same	Size of required funds	Possibility of securement of required personnel	Magnitude of direct effects	Urgency of implementation of program	Necessity of outside support	Possibility of realization of support	Evaluation of priority
[1] Augmentation and strengthening of FIDC				High (organizational advisors)					
• Training and testing	Yes	Augmentation	Large	Moderate degree	Large	High	High	Moderate degree (partial)	A
• Research and development of parawood	No	Establishment needed (development of furniture materials)	Large	Unknown	Large in medium and long term	Moderate degree	High	Moderate degree (partial)	A
[2] Raising of level of small and medium sized companies	Yes (FIDC)		Moderate (cooperative operations)	Not particularly necessary	Large	Moderate degree	High (joint ventures and tieups)	High (joint ventures and tieups)	B
[3] Promotion of joint ventures and tieups and promotion of exports	Yes (BOI/DEP)		Small	Not particularly necessary	Large	Moderate degree	High (joint ventures and tieups)	High (joint ventures and tieups)	B
[4] Augmentation of vocational education and training	Yes (vocational schools, training centers)	Augmentation	Large	Low (teachers and instructors)	Large in medium and long term	Moderate degree	Moderate degree	Moderate degree	B
[5] Measures for securing materials			Small	Not particularly necessary	Moderate degree	Moderate degree	Small (not particularly necessary)		B