



Cluster Development Programme, India

DIAGNOSTIC STUDY

SME

THE COTON KNITWEAR CLUSTER

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By UNIDO CDP, New Delhi

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Executive Summary

Tirupur, a small township 60 kilometers away from Coimbatore in Tamil Nadu is probably the hallmark of the success stories of Indian clusters. This township which started with the production of low valued cotton hosiery items mainly the undergarments during the 1920's started with exports from the year 1974. Since then, it has not looked back and the exports during the year 1996 touched a figure of 1421 million US dollars contributing of almost 38% of the country's exports in this sector. It is estimated that the industry in Tirupur employs 200,000 persons directly and indirectly. The exports of this product are regulated through the quota system under Multi Fibre Agreement of the World Trade Organization.

The cluster comprising of some 7,010 units, most of which are quite small, compared to the national and international standards, is interwoven through several commercial and non-commercial linkages. There is a high degree of subcontracting relationship among them due to the nature of operations. Almost 80 percent of the firms are exclusively working as subcontracting units, particularly for manufacturing the hosiery cloth. The cluster reflects a high degree of specialization in most areas including machinery supply besides every area of the manufacturing operation. Innovative services such as pre-production checks, initial and during production checks, product consultancy, laboratory testing, sourcing assistance are provided by several enthusiastic entrepreneurs that helps the industry galvanized.

The role of several industry associations is commendable who help the firms by playing quasi-judiciary role to settle various intra and inter firm disputes besides procedural formalities, information assistance and the lobbying role with the government. Among them, Tirupur Exporters Association is the most dynamic ones with several achievements to its credit during the last 6 years of its operations. The government institutions have also played a useful role in supporting the industry. However, the most important growth factors are proactive marketing, adaptation to the latest technology, inter-firm production arrangements and an active social system.

Some of the major issues that concern this industry for the sustainability of growth in the future relates to infrastructure and organization. Water scarcity, electric power supply and increasing pressure on the roads has put considerable strain on the industry growth. With the firms increasing moving towards higher value addition, quality and design inputs are becoming more crucial. Tirupur Exporters Association has undertaken some initiatives with the help of government and non government agencies to overcome the deficiencies build capacities to prepare the industry for future growth. The local service suppliers are also geared to provide linkages with the international arena by providing access to the global information and latest machinery. The industry has grown considerably over the last one decade and the future for now looks promising.

1. Industry Scenario at National Level

India is one of the largest producers of cotton in the world. Cotton textiles, hosiery and garments industry put together provide employment to over five lakh¹ persons mainly in the small scale enterprises. The knitwear industry in India is over a century old. It had its origin in Calcutta and later it spread to other parts of the country. Presently, main centers where this industry is located are Tirupur (Tamilnadu), Delhi, Calcutta, Bangalore, Ahmedabad, Saharanpur, Surat, Kanpur (Uttar Pradesh) and Mumbai. Initially, the industry produced mainly under-garments in hosiery. It is only in the last 15-20 years that the industry started manufacturing outer-wear like T-shirts, cardigans, jerseys, pull-overs and polo-shirts.

It is believed that the first small scale hosiery unit was started by an enthusiastic entrepreneur from Calcutta in the year 1893 in a small shed in Khidderpur. This industry has now grown multi-fold and made a significant contribution to our economy with almost 10,000 units. Besides, there are several other units that are supporting this industry by producing related products. The production of hosiery yarn and hosiery products both are now 16% of the total textile products.

Contribution to exports significant :

The industry contributes significantly to the exports of the country. Their production is estimated to be 1300 million pieces per annum. Almost one-third of the production is exported and the rest is consumed within the national market. Of the total textiles exports of Rs. 31,336 crores² in the year 1994-95, hosiery exports were Rs. 3,151 crores.

National and international regulations :

At national level, most of the cotton hosiery items are reserved for manufacturing in small scale industry. They are knitted cotton cloth, vests, socks, undergarments, shawls and 'other cotton knitted wear'. The process of knitting itself is however not reserved³. At international level, the exports of the hosiery garments and other textile products are regulated by the importing countries through an extensive quota system under Multi - Fibre Agreement of World Trade Organization (WTO).

Future scenario :

With the signing of 'General Agreement on Tariff and Trade' (GATT), the Multi - Fibre Agreement will be phased out over the next decade giving additional opportunity to the country to increase its presence in the international arena. Secondly, an international shift from the synthetic man-made fibres to the use of cotton will also help to boost demand for cotton apparels in general and cotton hosiery products in particular. Cotton hosiery industry can continue to be a major export earner in future as well.

¹ 1 Lakh is equivalent to one tenth of a million.

² 1 crore is equivalent to 10 times of a million.

³ As per the interview with Mr. Subramanyam, Secretary, Tirupur Exporters Association.

2. Landmark History and Performance of the Cluster

It is said that the small dusty township of Tirupur⁴ 60 kilometers off Coimbatore and part of Coimbatore district breeds millionaires. The geographical location of Tirupur on India's map is reflected as given in *Annexure I*. The township of Coimbatore is well known for electrical machinery & parts, metal products and other machinery products. Entire district of Coimbatore has a total of 70 Medium and Large scale units with Rs. 532 crores worth of investment of which Tirupur has 9 of them with a capital outlay of Rs. 76 crores. The hot climate suited the bleaching and dyeing operations for the knitted cloth. With several thousand small scale units, this industry provides direct and indirect employment to an estimated two lakh persons in all the skilled, semi-skilled and un-skilled categories although according to Apparel Export Promotion Council (AEPC) and Tirupur Exporters Association, this figure is around 3 lakhs. There are very few medium scale units since the product is reserved for manufacturing in small scale sector. Availability of good quality cotton in the surrounding region and hundreds of cotton yarn mills around are inherent basic strengths of the industry. Direct exports from Tirupur were in the order of Rs. 1,448.76 crores (approximately US \$ 425 million) during the calendar year 1995. This accounts for 42% of India's total exports in this industrial segment.

Tirupur has been described as a 'boom town' whose growth is based upon cheap labor and , a tradition of cotton weaving and inter-firm production arrangement. During the last five years, the population of this town has more than doubled to five lakhs inclusive of the villages in its periphery. There has been a large scale migration of people from villages and other surrounding regions and with the growth of industry the township has also outspread the nearby villages. Here, tiny and small sized firms have successfully brought about innovations and improved their efficiency.

Tirupur was the second town in India to start a unit in this industry after Calcutta. Even though knitting came to Tirupur in 1920s, progress worth mentioning took place only after 1935 when the first hand-operated hosiery firm was set up. The number of knitwear firms went on increasing. It was over 100 in 1953, 450 in 1960 and about seven thousand now. Since agriculture was not flourishing due to poor rainfall, the industry served as a source of alternate employment. The low investment required in hand operated knitting machines, easy availability of raw material and yarn from the neighboring Coimbatore town helped the entrepreneurs set up their manufacturing base, and keep on widening that.

Till the late 1960s, this industry produced mainly the grey and bleached vests (called banians⁵ **Error! Switch argument not specified.**in Hindi). In 1968, other items but mainly underwear began to be manufactured and in 1974 the first export consignment was shipped abroad under support from 'National Small Industries Corporation' (NSIC). From 1980 onwards, some of the entrepreneurs also began to produce T-shirts for exports. Some Mumbai and Delhi based exporters established their sub-offices at Tirupur which led to further acceleration in exports. Some of the producers at Tirupur also developed independent contacts with foreign buyers. Meanwhile, the Tirupur producers turned also to the country's domestic market for cotton vests.

⁴ The word 'Tirupur' is associated with 'spinning' in Tamil language.

⁵ Tirupur was therefore called a banian city.

Soon need was felt for further diversification into fashion garments which required improvement in quality. With their focus on diversification & quality control and strength of direct connections with foreign buyers, entrepreneurs brought about sudden changes in the production technology which revolutionized the industry. It was in 1990s that along with undergarments, the manufacturers produced quality outer-wear. The cluster, now into multi product cotton knitwear, produces T-shirts, cardigans, jerseys, pull-overs, ladies blouses, skirts, trousers, sports wear and industrial wear. The exports increased many times reciprocated by a corresponding faster inflow of foreign exchange. With the implementation of liberalization, the awareness about new technologies and import of high technology capital equipment have taken a surge.

GROWTH OF DIRECT EXPORTS OF COTTON HOSIERY FROM INDIA AND TIRUPUR (Quantity in Million pieces and value in Rs. crores)						
YEAR	ALL INDIA		TIRUPUR (DIRECT EXPORTS)			
	PIECES	VALUE	PIECES	VALUE	% of All India value	Value/ piece (In Rs)
1984	49.54	89.22	10.42	9.69	11	9.3
1985	56.68	104.89	17.21	18.69	18	10.9
1986	80.2	159.38	28.87	37.48	24	13
1987	112.24	283.85	39.17	74.49	26	19
1988	120.95	358.19	45.91	104.24	29	22.7
1989	165.6	343.17	61.4	167.39	49	27.3
1990	222	851.24	88.87	289.85	34	32.6
1991	243	1,147.03	90.5	429.48	37	47.5
1992	303	1,894.69	133.9	773.37	41	57.8
1993	413.1	2,894.38	189.3	1,162.43	40	61.4
1994	407	3,151.37	196.4	1,318	42	67.1
1995	NA	3,580	NA	1,489	42	NA
1996	NA	4,833	NA	1,850	38	NA

Sources: 1. Direct Export figures from Apparel Export Promotion Council, Tirupur.

2. Cotton Textile Export Promotion Council

The cotton knitwear sector experienced a remarkable record of export growth during 1980s and 1990s' as the demand for cotton clothing rose in the world. Tirupur emerged as India's leading cotton knitwear export center. The growth in exports, increasing value addition and its share at All-India level is reflected in the table given as under. It is estimated that while direct exports from Tirupur are only 42% during the year 1995, actual contribution to exports including indirect exports should be almost 80% of the total.

3. Sketch of the SMEs, other Enterprises and Institutions

At the center of the Tirupur hosiery cluster are the cotton knitwear garment exporters who may be either 'manufacturer exporters' or 'merchant exporters'. The non-exporting manufacturers undertake sub-contracting tasks mainly for the exporters of both the categories mentioned above and in addition they market the knitwear for domestic market. There are a number of different types of agents and traders who facilitate the marketing activity. These actors are selling agents, depot sales agents, commission agents and general merchants. In Tirupur, the marketing agents have a strong role to play. They have developed specialization in different geographical market segments, domestic and overseas, as also in product based segments. Further specialization has developed to the extent that there are agents who market only the rejected goods and the export surplus material. The cluster map of various actors in Tirupur is shown in *Annexure II*.

There are varying estimates for the total number of units according to different agencies. According to 'District Industries Center' there are a total of 7010 registered Small Scale industrial units at the end of the financial year 1996-97, of which 5515 of them are producing hosiery garments while another 576 produce hosiery cloth. It is estimated that almost 80 percent of the units are engaged in job work only. Besides all these, there are a large number of ancillary and supporting units that manufacture buttons, printed labels, polythene bags, plastic tapes and other packing materials.

Composition of SSIs in Tirupur				
Type of units	No. of units	Percentage	Investment (Rs. Lakhs)	Employment Generation
Hosiery Garments	5515	78.67	5527	74822
Hosiery Cloth	576	8.22	3005	3945
Bleaching	70	1	187	821
Dyeing	171	2.44	852	1903
Calendering	74	1.06	334	572
Screen Printing	258	3.68	665	2829
Embroidery	12	0.17	209	92
Mercerizing/ Raising/ Curing	14	0.2	103	109
Other Allied Units	298	4.25	228	1312
Export oriented units	22	0.31	1638	316
Total	7010	100	12548	86721

In the service industry, there are both forward and backward linkages specially in relation to input supplies and distribution. According to the estimates of DIC, there are likely to be another 750 unregistered Small Scale units which do not figure into the below given table. Many of them may be in the area of bleaching and dyeing where registration due to difficulties with pollution control does not make them eligible for registration and thus other state sponsored facilities.

In terms of employment generation, the direct employment generated is estimated to be one lakh skilled, semiskilled and unskilled workers while another one lakhs persons are estimated to be earning their livelihood due to this industry. These indirect activities relate to the forward and backward linkages within the industry such as cotton ginning, yarn spinning, specialist tailoring, calendering, packaging and other related service activities. Among the 7010 units, it has been estimated that there are 150 integrated units with a much higher capital investment than most of the Small scale units.

The main raw material in the form of cotton yarn of different thickness is supplied by the agents of hundreds of spinning mills located in Coimbatore, Salem, Erode and other adjoining cities. Several mills have set up their sales depots at Tirupur to provide raw material on ex-stock basis. Besides, there are also several cotton yarn merchants in Tirupur and Coimbatore. Specialty stores, selling accessories such as buttons, zips, laces and sewing threads are there in a large number in Tirupur itself. Similarly the dyes and chemicals that are manufactured mainly in Gujarat and Maharashtra are available through companies' sales depots and through merchant dealers in Tirupur, itself.

The manufacturers of the circular knitting machines and dyeing machinery are mainly located in Punjab, specifically in Ludhiana and Amritsar. With the introduction of new technology, imported machinery has been in a widespread use in Tirupur. The commission agents and dealers for both indigenous and imported machinery are based in Tirupur providing access to the latest models available world-wide. An important agent, among others providing imported machines, is 'Mehala group of companies' with a total employees strength of 350 persons, and a dozen individual enterprises. Besides supplying machinery, they undertake servicing of the machines, and provide training to the industry workers in machines working, servicing and maintenance.

Conducive to the need of export market, innovative service enterprises have been set up by private entrepreneurs. These services are targeted at exporters, suppliers, manufacturers, buyers, importers and the retailers that help their customers to reduce their risk, improve efficiency, provide inputs for cost control, implement and ensure compliance of the mutually agreed quality systems. For example, the range of services provided to importers may comprise of pre-production checks of exporting enterprises, initial-production checks, during-production checks, final random inspection, status reporting, container loading supervision, damage survey, product consultancy, sourcing assistance, factory assessment and laboratory testing. This helps to bridge the gap between the manufacturer and the buyer and to create a greater degree of confidence in the marketing channel.

Several active associations exist :

There are as many as seven sub-sectoral industry associations in Tirupur. For example, the dyeing & bleaching units have their separate association. With firms inter-related through common control, entrepreneurs could end up becoming members of more than one associations. Besides, more than one associations may be looking after the interests of same category of members.

Playing quasi-judicial role to settle various disputes :

The importance of these associations can be gauged from the fact that all these bodies act as quasi-judicial institutions which help to resolve the inter firm and within firms' commercial disputes. Some of the associations such as 'Tirupur Exporters and Knitwear Manufacturers' Association' (TEKMA) also get the long standing inter-firm payments cleared among the members. The associations also take up a more pro-active role to settle the labor wages keeping in mind the government regulations. The wages then become the standard norm for the industry as a whole. Any dispute arising between the labor and management is also settled by the associations. This helps the entrepreneurs in utilizing their time better in terms of more productive economic activities.

Providing several other services as well :

The South India Hosiery Manufacturers' Association (SIHMA) also assists its members to get financial assistance from the banks and financial institutions. On the procedural front, assistance is also provided in getting the registration certificate of Small scale industry, Reserve Bank of India code and export import license issued. Besides, it also files legal suits in courts and represents on behalf of their members.

'Tirupur Dyers Association' conducts workshops and seminars to educate their members on the latest trends. It has also taken up an active role on the issue of pollution control by representing the case to the authorities concerned. Besides, it is scouting technical collaboration for setting up the water treatment plants. It is also coordinating the setting up of 8 common effluent treatment plants on behalf of its members which will then cover 70% of the firms wanting treatment facilities. It has filed a representation with the concerned institutions to get subsidies on investment in pollution control as also loan facilities for the members.

The associations are also involved in collection and dissemination of information to their members through their regularly printed bulletins which are published periodically ranging from fortnightly to quarterly basis. The bulletins are published both in English and Tamil languages. These bulletins contain reports on recently organized meetings with the government officials, texts of memoranda issued to the various ministries and formats of various forms and certificates required for regulatory purposes. Besides, the bulletins contain informative articles on new financing instruments, changes in international regulations, specific restrictions from importing countries, information about forthcoming fairs and seminars etc. These also carry several advertisements from the local units including lists of machinery and raw material suppliers.

Among them, TEA is the most dynamic :

The role and importance of 'Tirupur Exporters Association' (TEA) among the various associations needs a special mention in this regard. This association which was established in July 1990 by Shri A. Sakthivel of 'Poppys Knitwear' represents the interests of cotton knitwear exporters who have their production facilities based in Tirupur. It has 285 life members, each having paid a membership fee of Rs. 50,000/- and 149 associate members. The important objectives of this association are to help achieve multilateral growth of knitwear industry and

exports, development of infrastructural needs of Tirupur and implementation of any other such scheme that may benefit the association and the public at large.

Some of the important achievements of TEA are setting up of a modern industrial complex in one hundred acres area which is about nine kilometers away from the township. With the first phase already completed and operational, the number of sheds will be increased to 189 at the end of second phase. This would involve a total investment of Rs. 200 crores and would have all the infrastructure facilities such as wide roads, water supply, 2,000 line electronic telephone exchange and a power substation besides the social infrastructure comprising of post office, recreation centers and shopping facilities. TEA has promoted, at the invitation of the state of Kerala, a similar complex called TEAKNIT industrial complex in Kanjikode, near Pallakad.

To reduce the problems arising due to scarcity of water in Tirupur, TEA has prepared a scheme for integrated water supply and effluent treatment project with the help of Government of Tamil Nadu and a private leasing company. The scheme which is still at its conceptual stage will, when implemented, cost Rs. 250 crores for diversion of water from the river Cauvery, flowing several kilometers away into Tirupur. In order to promote exports, it jointly arranged International trade fairs with 'Apparel Export Promotion Council' in 1995 and 1996. Among the future plans, it proposes to set up a training and fashion institute in collaboration with 'National Institute of Fashion Technology' with financial assistance from the industry, central government and state government.

It has also set-up an Inland container freight station for fast, safe and timely movement of export cargo. This has been done jointly with a private company of clearing, forwarding and shipping agents, Lee & Muihead limited. This station that started functioning from June 1995 has been set up in 3.2 acres of land and has a facility for simultaneous loading and unloading of 12 containers, has 19 built up offices for the steamer agents and 25 desks for the clearing & handling agents. Besides, it also provides office space for the 6 member staff of the customs office, so that all the formalities related to the customs are cleared here itself. With the usage of this terminal, stuffing of containers is now possible in the presence of exporters. It has helped the industry by reduction of delays, wrong dispatches, pilferage and damage of cartons.

Building future entrepreneurial capabilities :

TEA has set up a residential public school along the most modern lines for the youngsters from this industry. This is called 'TEA Public School' and is functional with effect from June 1995. Besides regular curricula, the school will provide high thrust on international aspects including modern communication and various foreign languages to build up necessary entrepreneurial capabilities among the managers of future.

Other institutions :

There are a number of other key institutions which provide sectoral support. They include 'South India Textiles Research Association' (SITRA), 'Apparel Export Promotion Council' (AEPC), 'Textile Committee' and 'National Small Industries Corporation' (NSIC). Besides, the nationalized banks, 'Tamilnadu Industrial Investment Corporation' (TIIC) is also involved in providing long term and short term financial assistance. Government has set up several

industrial estates. These are SIDCO industrial estate (40 sheds), Ganapathypalayam (30 sheds) and Chettipalayam (37 sheds).

In order to meet the technical requirements for the development of this industry, 'Apparel Export Promotion Council' (AEPC), Tirupur, in collaboration with the 'South India Textile Research Association' (SITRA) has established a small institute for research & development, laboratory testing and facilities for training. The major objectives of the center are to impart necessary training and skills, testing facilities for quality improvement and standardization, consultancy services and library facilities. During the last five years from 1991 to 1995 it has organized 66 training programs of 7 different types which has helped to train 1161 participants so far. Besides it has provided consultancy services to more than 200 units in relation to shrinkage control of knit fabrics, color fastness, improvement in dyeing and printing, defect analysis and setting up of new projects.

AEPC-SITRA Knitwear service center prepares fresh degree holders and diploma holding students as middle management personnel both in manufacturing and administrative levels. It is called 'knitwear manufacturing technique and Management' certificate course spread over three months training.

Apparel Export Promotion Council (AEPC) :

It was set up in 1978 by the Government of India to stimulate export growth and act as advisor to buyers, exporters and government. It regulates the textile quota system as per the international 'Multi Fibre agreement' and the bilateral trade agreements reached at with other importing countries. This organization also sponsors trade fairs and trade delegations besides providing information to the exporters on national and international regulations affecting the industry. The council also releases information on inquiries for export which helps the present and prospective exporters. The council has a library facility here which however due to the shortage of funds, is unable to stock the latest quality journals.

Together with 'Tirupur Exporters Association', 'Apparel Export Promotion Council' organized knitwear fairs in August 1995 and June 1996. These fairs attracted a large number of foreign buyers. During one of the recent fairs called 'India Knit Fair 1996', there was a widespread participation by knitwear exporters from all over India. The fair drew foreign buyers from several importing countries including the United States, United Kingdom, France, Germany, Canada, Netherlands, Italy, Hong Kong, Thailand, United Arab Emirates, Australia and South Africa. Reportedly, huge spot orders were received from buyers.

Textile Committee :

It was established under the 'Textile Committee Act' 1963 as a statutory body under the administrative control of the Ministry of Textiles, Government of India. It has under its ambit a vast range of functions such as scientific, technological and economic research, export promotion, establishment of standards and regulations, specification of the type of quality control, pre-shipment inspection, establishment of laboratories and test houses, collection of statistics for market study and rendering advice on all matters relating to quality assurance and development of textile industry and production of textile machinery. The committee with its

head office in Mumbai has 27 regional offices set up all over the country of which one is in Tirupur with a test house. Depending upon the authentication of the products by the Textile committee, AEPC issues the certificates and thus helps the exporters in shipment.

'National Small Industries Corporation' (NSIC) provides financial assistance through leasing and hire purchase for buying indigenous and imported machinery. NSIC can also help to procure the machines on behalf of the customers. Besides, it provides finance for procurement of raw material through bank guarantee. The corporation has provided assistance to almost 100 units in the cluster. With the coming up of private leasing and financing companies, the corporation faces competition despite the fact that cost of finance provided by it is lower than that of the private companies.

Commercial banks and Financial institutions :

Are active in providing short term and long term finance for the industry for the working capital, bill discounting, export financing, raw material purchase and capital equipment. There are also some of the private sector banks such as Karur Vyas Bank, Times Bank, Bank of Madura and Lord Krishna Bank which have set up their operations in Tirupur.

4. Analysis of Business Operations in the Cluster

Marketing

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Limited domestic market :

Domestic market for the hosiery products, particularly for the conventional under-garments, comprises of an estimated 250 million consumers. Despite the large size of market, bulk of the demand exists mainly for the low quality and low value added products in the cotton knitwear segment. In fact, introduction of the concept of ready-made garments which includes hosiery products, is a comparatively recent phenomenon probably beginning from the early 1980's. Even this is largely limited to the metropolitan cities and major towns. Outer wear garments such as jerseys, pullovers, trousers, night dresses, sports wear and ladies blouses made of knitted fabric does not form a part of Indian dress, conventional or modern. Most of the reputed brands of Tirupur such as Crystal, Rupa, TT, Lyrill, VIP, Gopal, DSP, Dawn, Liberty and Tan Tex can therefore be related by the domestic consumers with their undergarment products mainly.

Diversification to export market therefore logical :

Knitted garments find their market all over the world and the consumers belong to all age groups from children to the aged. Diversification to the export market mainly in T-shirts but later also in other items such as jerseys, pullovers, cardigans, ladies blouses, dresses, children wear, sports wear, night dress, swim wear, bed linen, industrial wear & non apparel products like gloves has been therefore a logical step for the industry for a higher value addition. Export market that the industry has expanded their demand in, comprises of most of the countries of European union, United States of America, Canada, Japan, Middle East and a few other countries. The unit value realization from the exported products has increased over a period of

time as also due to improvements in quality. Secondly, the industry has complied with the changing fashion tastes of the consumer market.

Wide range of differentiated market intermediaries :

The Tirupur knitwear cluster has become much differentiated and contains firms of quite different capabilities producing for quite distinct markets. The smallest of the firms sell to small local markets and make simple garments; comparatively larger firms sell geographically to more distant places in the domestic market through intermediaries and also undertake job-work for the export markets. The established bigger manufacturers produce garments for direct exports. These differentiated types of firms and segmented markets give rise to a number of different types of agents and traders in the industry such as selling agents, depot sales agents, merchant workers (commission agents) and other merchant dealers, some of them with their respective fields of specialization.

Exports led market structure :

Most of the production in Tirupur is now targeted for the export market. With this, apparel designing along with quality improvements has become an important parameter for success. This in turn has its influence on the production technology and demand for such machines that are flexible enough to produce various types of combinations. In order to take advantage of the low costs and keep a close check on the quality for their consignments, some of the importers and merchant exporters have stationed their representatives at Tirupur itself. This close interaction between market agents and manufacturers results, directly or indirectly, in product standardization, maintenance of quality and intense price bargaining. Sometimes, the agents or their representatives also seek assistance from the locally based testing laboratories for matters pertaining to technical aspects.

The major problem that exists with regard to exports is the quota restrictions as regulated under Multi Fibre Agreement. The merchant exporters who are based in metropolitan cities manage to obtain substantial part of the total quota available to India on their past performance on exports. In the meantime when Tirupur based manufacturers want to expand into exports, some of them find it stifling, since they have to either buy the quota allotment from the open market (at a price that eats into their profit) or compete for a small share reserved for new entrepreneurs by Apparel Export Promotion Council. Besides this, there do exist common problems related to the export market when the buyers or suppliers are unable to meet their financial, technical or commercial commitments. This leads to cancellation of orders even after most of the processing has been completed which may take 30 to 90 days. In Tirupur, it has led to the development of a separate market for the export surplus items that are then bought at cheap rates by some merchants, specialized in this line of activity. These consignments are then sold in the domestic market through their distribution channels.

The development of Inland Container facility in Tirupur has helped the exporters in a big way. Chasing the goods to distant places where the port facility existed, unloading the material and getting them reloaded into the container was a big problem for the exporters. With the inland facility, it has saved the exporters of such inconvenience, loss of precious time and other

resources. The development of packaging industry has also helped significantly in improving the handling and forwarding of goods.

Despite a commendable export performance of the cotton hosiery industry in India, its share in the international market remains an insignificant two percent. The demand potential is therefore quite high. The industry faces competition in the international arena from Yugoslavia, Slovenia, Croatia, Turkey, Israel, Malaysia, Indonesia and the neighboring countries of Bangladesh, Pakistan and Sri Lanka. Secondly, the value addition per piece which has increased significantly from its previous level, is still way below the international potential. The quality goods supplied from Tirupur are exported mainly under the brand names of the importers. Recently however, some of the merchant exporters have also taken initiative to get their own brands propagated. Also, despite the diversification of units into new product segments, the predominance of production remains in the low and basic knitted garments such as T-shirts.

Apparel Design :

The designs for garments are usually provided by the buyer importers. There are 4-5 large exporters who have set up their in-house facilities for developing new designs which help to add value to their product. However, most others who wish to add this activity into their portfolio are unable to do so since private institutions providing such specialized services do not exist.

Raw material availability :

One of the strengths of the cluster comes from the facts that cotton produced in the region is of a superior quality. Availability of the quality raw material, cotton yarn, for the industry is ensured since the state of Tamilnadu itself has maximum number of spinning mills in India. Coimbatore, the adjoining city of Tirupur is called the Manchester of South India due to availability of related skilled labor, several spinning mills and good quality textile machinery which is produced there. The spinning mills association sometimes regulates the prices of yarn leading to fluctuation in the prices of yarn. This itself may be the result of fluctuating cotton prices depending upon the yield and availability of raw cotton.

Labor:

People come from rural areas around Tirupur to work. The wages are settled based on piece rates. A 12 hour (one and a half shift) six days working week is not unusual in firms when export commitments need to be fulfilled on time. This also provides them with the incentive to earn more at the end of the day. When production schedules are especially tight, labor is called upon to work 16 to 18 hours a day. Women, young boys and girls are considered for less skilled jobs. In general, workers have become highly skilled in the course of working in a number of different jobs. The general wages for the permanent workers are settled in consultation with the representatives of the labor and the employers by the local associations taking into account the government regulations, inflation and length of service.

It is also a common practice that the entrepreneur for getting a specific job done in one of its sister concerns under the same umbrella organization network, employs a job-work contractor for the assignment. The contractor then acts as a production manager and is also responsible for recruitment and working of the labor. This arrangement, called 'in-contracting' helps the

entrepreneurs rid themselves of the responsibility for detailed production management of the operations. Since the owner deals separately with one contractor each in his sister concerns, he also manages to side-pass several labor regulations concerning state insurance or provident fund etc. The wages and bonus, settled by the contractor in such cases are in accordance with the local norms and statutory minimum wages. Subsequent revisions in the wages are paid in line with the government policy. Average worker earns well as per the prevailing standards.

Importers in the industrially developed countries have shown an aversion to the products made in firms employing child labor. With this, the TEA has taken up a proactive role with the result that it is a common sight to see sign boards on the gates of firms declaring non-employment of child labor. This seems to have worked especially with the exporters.

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Production:

The production system technically comprises of four operations organized around different firms. These are i). knitting of cotton yarn to make grey fabric, ii). bleaching & dyeing of grey fabric iii). fabrication of garments and iv). printing & finishing. The production stages and the actors involved therein for the knitwear garments are shown in the enclosed *Annexure III*. The four stages are explained as under;

- i. **Knitting:** The cotton yarn obtained on the cones is mounted directly on the circular knitting machines manufactured either by several small firms in Ludhiana, Lakshmi Machine Works limited, Coimbatore or elsewhere abroad, in that order of increasing flexibility of designs, speed and quality of output. Technological developments have helped simultaneous usage of different colors and weights of the yarn in the more sophisticated machines. Some of these developments are introduction of multi-track cone combination, usage of different types of needles, introduction of multi feeder points, independently controlled positive feeder and technically upgraded stop motion when a yarn thread breaks in between. It is mainly the imported microprocessor controlled circular knitting machines that allow changes in the type of design patterns on the fabric. As many as 82 different machines are used in knit garments and 20 machines are used in processing for ready made garments.

For every diameter size of the grey fabric so produced in the form of loop, equivalent diameter size of the knitting machine has to be used. This implies that in order to produce 10 different diameter sizes of the loop fabric, ten different circular knitting machines of those sizes will be required. Although Ludhiana made machines, especially the second hand ones, do not entail high capital investment for each machine, it is still not considered feasible and beneficial to set up a complete range of various sizes of knitting machines in one firm. There are almost 2,000 knitting units that take up subcontracting jobs. This is the first basic cause of subcontracting phenomenon. While the low end producers of under-garments with no specific design requirements would use the Ludhiana made machines, the higher end ones producing patterns of designs on the fabric would invest in the expensive but fast machines from LMW, Coimbatore or abroad. The cloth so knitted is marketed in rolls. This forms the first and the basic process in garment making.

The knitting machines once set to knit yarn into fabric keep operating automatically unless the thread breaks in between and the operator then has to tie it before starting the machine again. One operator may therefore be able to manage 10-12 machines together. The type of indigenous machines used are named as interlock circular knitting machines, rib interlock machines, singer body machines and spindle bobbing winding machines. The quality of fabric so obtained depends upon the density of knitting measured by count and thickness of yarn measured by weight per unit area. The other quality control parameter is loop length that measures the linear length of yarn in a knitted loop. It is also important to ensure dimensional stability of the fabric to washing. The feel of the knitted fabric much depends on the twist of yarn used, which measures the spiral turns given to a yarn in order to hold the constituent fibres or thread together. Low twisted yarn is always preferred for knitting. From the consumers view point, these technical characteristics provide uniformity, flexibility, low friction, elasticity, smoothness and strength.

- ii). **Bleaching & dyeing** : Bleaching the grey color of the knit fabric is essential for the dyeing process. This process involves mixing of bleaching powder in water through which the grey fabric is made to pass. There are various other chemicals used as well. Almost sixty percent of the bleached fabric requires dyeing and it accounts for almost 10 to 15 percent of the cost of finished garments. The most essential requirements for dyeing are getting the correct shade on the fabric as per the buyer's specification and its color fastness. Any deviation thereof may lead to rejection of the lot and entail losses for the dyers.

The skills of dyeing master are therefore crucial in the process who mixes various base dyes to get the correct shade. This hit and trial method of mixing to get the correct shade leads to a loss of dyes to the extent of 50%. The dye-Master would normally stay within the factory premises to take care of any contingencies in the operation and control the process parameters. The most important machinery used in the process is a simple winch machine. Other supporting equipment required are a boiler and a big tank with an open furnace. About 10 litre water is taken per kilogram of cloth and pre-dissolved diluted dye-stuff is added to the tank with the cloth rotating on the roller winch continuously. In almost two hours of time, the dye-stuff is completely absorbed by the cloth which is then rinsed with fresh water, and treated with a few other ingredients and detergents. The complete cycle time is 6 to 10 hours. The quality of dyeing is also determined by the hardness of water used. Pre-dyed yarn is not often used.

The major problems that the 600 bleaching and dyeing units face is the scarcity of water for which the firms have to buy water in tankers from the adjoining villages. Almost 600 lorries of water each priced at Rs. 300/- provide water daily to the industry. This has its effect on the cost of operations equivalent to almost Rs. 1.8 lakhs per day to the industry. The scarcity of water itself has arisen due to shrinkage of ground water level because of its - over drawing with the phenomenal growth of industry. Secondly, the water available has become so polluted that its hardness measured in salt content has gone upto 1400 PPM whereas the required level is below 350 PPM. So it is found unfit for the operations. The state pollution control board has issued notices for the closure of units or else installing necessary pollution control equipment. Most of the units have now undertaken steps for installation of common effluent treatment plants. Eight such common effluent treatment plants are under way which will cover 40% of the firms.

A separate private company called 'Kasipalayam Common Effluent Treatment Company' (KCETC) has been floated to set up one such plant. It has approached the state government to facilitate a tie up with international agencies like UNDP, UNIDO or European Union for technical collaboration and economic assistance. Besides, the industry has demanded for restoration of 50 percent of subsidy for the construction of treatment plants. A request has also been made for duty-free import of equipment and machinery required for such projects because many dyeing and bleaching units do not have sufficient resources to meet the required expenditure.

The other problem relates to the new international regulations that affect the choice and usage of certain types of chemicals and dyes. Knowledge about these chemicals, testing methods to detect them and finding suitable alternatives is beyond the capabilities of most of the firms. For example, Germany has put a ban on usage of azo dyes in the fabric imported into that country. The local institutions such as SITRA and Textile committee, although know the names of these

dyes yet they would not be quite familiar with new methods of testing involved to detect all such named dyes or thereafter to suggest the entrepreneurs on the usage of alternative means. Similarly, chlorine, pesticide residues, heavy metals and formaldehyde have been banned for usage by the European Union.

- iii). **Fabrication :** The process of fabrication comprises of cutting the print fabric according to the pattern and thereafter stitching as per the specifications of the garments. While cutting is done manually with the help of a pair of scissors or a small cutting machine, stitching is carried out on sewing machine, manually or electrically operated. Sophisticated indigenous and imported sewing machines are used not only for high speed stitching but also for the various stitching designs. This process is the most labor-intensive one involved in this industry.
- iv). **Printing and finishing_:** Printing is mainly done on the garments although it could also be done on the bleached fabric before stitching. There are many SSI printing units which undertake the work on job work basis. However, it is important that before printing is undertaken, calendering is done to ensure smooth surface of the fabric for printing. Calendering is the process of ironing the garments with a steam press steam in order to remove the wrinkles.

Textile printing may be done in a number of ways. These are broadly classified into four types as handblock, stencil, screen and roller printing in the order of increasing sophistication, speed and quality. Screen printing is mostly employed in the cluster but the increasing export demand for multicolored and high end print quality has led to the setting up of several multi-speed roller printing machines. The calendered polyester cloth in this case is sent for printing before being ironed and stitched into finished garments. Other finishing operation that is not currently in demand but could be used is 'embroidery'.

Subcontracting relationship of the production system :

Out-contracting in large firms minimizes the need for vertical integration within firms and gives small firms the advantages of flexibility of operations with better capacity utilization. Capital constraints to expansion are minimized for the cluster as a whole. Also, large firms can restrict the size of their labor force without inhibiting the expansion of production. There are also many small independent firms that undertake processes more specialized in nature. The very availability of numerous process specialized smaller firms saves on the costs of space, machinery and labor. The mutual exchange of information and skills has made small firms gain capability of meeting more stringent standards necessary for garments, especially for those meant for exports.

Pollution Control :

Some of the bleaching and dyeing units allow their effluents to flow out without treatment. Many of them discharge their effluents into confluence of Udai into Noyyal river. A substantial number of them are discharging effluents from their units into the nearby river. There are some units who find nearby bare spaces suited to them for open percolation or Municipal drains.

Some units have offered to erect their own treatment plants. Such units have been identified and are 866 in number and have received notices from the court. Out of 866 units, 114 units have

closed down while remaining 752 units are operating. 466 units are proposed to construct individual treatment plants and 288 proposed for the Common Effluent Treatment Plants (CETPs). Eight of them have already started work on Common Treatment plants. In most of the plants civil work has been completed and the machines are yet to be installed. Several units have requested the government to grant them subsidy for such an expenditure which for the short term seems to be unproductive .

Seasonality of operations :

During Monsoons, the operations of knitting, bleaching, dyeing and printing are difficult to carry out. It is therefore that the two months of July and August are a lean period for the industry. During this time, the workers are laid off or they take long leave. The exporters concentrate on new designs for the upcoming season and the manufacturers get their equipment renovated.

Training :

Role of in-house training for the entrepreneurs and labor has been the most important. There are several firms that have been set up by entrepreneurs who were previously the employees in one or the other related firms of the industry. They gained experience, managed some financial resources from the family & friends, left the jobs and started their own ventures. An example of such a case is that of a son of the peon of an erstwhile firm who is successfully running an export house (Yuvaraj International) in Tirupur which had a turn over of about Rs. 50 crores in the year 1993⁶. Some other entrepreneurs, who had resources with them, entered the industry and made use of the local expertise to manage their operations.

Training for the labor, supervisors and more skilled persons such as dyeing masters has been made available by different institutions such as SITRA. However, informal ways of training through on the job experience, job rotation and working experience with different firms seem to be the main source.

Developments in Technology :

Industry has made breakthrough in value addition by producing sophisticated knit garments that call for state of the art technology along with high quality of raw material, better processing machines, improved dyes and new designs. Soft flow dyeing machines, compacting machines for minimizing residual shrinkage, HTHP machines, dyeing machines, computerized color matching systems, stenter machines for removing deformity in the knitwear are some of the many new machines that have been brought into the industry. All these new machines are available to the entrepreneurs in Tirupur itself through private indenting agents. The entrepreneurs come to know about new machines through local advertisements and at occasions when the agents call upon to brief them about new developments.

⁶ 'Against All Odds' - New Delhi, India Today, March 1993 pp. 179.

During the last two years, about Rs. 250 crores worth of new investments have taken place⁷ in the base knitting and processing sectors and over 200 units have taken up to modernization of their production processes with fresh investments. About 800 new knitting machines have been imported from abroad, during this period. In fact, the knitwear business is highly fashion-oriented, therefore, export production runs are more effective in promoting flexibility, than the use of cost reducing specialized production equipment. In this way, while individual entrepreneurs may go in for specialized production machinery, the industry as a whole cannot use high cost technology on a large scale. Moreover, the net-working system is such that the technological services, wherever in the cluster they are, can be availed of by all the manufacturers. Currently it is believed that there are almost 20,000 indigenous and another 600 imported knitting machines in Tirupur.

For the export consignments, there are several types of new tests which are being insisted upon by the importers. Some of these tests that relate to yarn are count, CV % count, strength, CV % strength, CSP, twist, CV % twist, composition and barium activity etc. The tests which are required for fabric, made-ups and garments are count, construction, color fastness to various parameters, moisture content, dye identification, dye fixing efficiency, solid content, composition, tensile strength, tear strength and several other physical ones. The test instruments are quite capital intensive in nature and are difficult to be afforded by individual firms.

Availability of finance :

Short term and long term finance is available from the state financial institutions and commercial banks. There are also a few private sector banks there. Besides the public institutions, private financing firms and leasing companies have also set up their establishments in Tirupur. The interest rates when compared to the public institutions are higher but the procedures are easier in the case of private companies. The problems that industry mentioned related to the high interest rates prevailing in India compared to the international level. This affected the competitiveness of the industry at the global level.

⁷ 'Rs. 97 crores Export Enquiries at Knitwear Fair' - Hindu Business Line, June 24, 1996; pp.3

5. Assessment of the Overall Organization of the Cluster as a Response to the Competitive Environment

The success achieved by this small town is no doubt substantial. With nearly 80% of the nation's knitwear exports originating from this industrial cluster which in monetary terms is worth more than Rs. 2,400 crore (approx. US \$ 680 million) in a year. Tirupur is a case of a relatively successful third world industrial cluster and probably the most successful one in India. The kind of merits of industrial clusters listed by Nadvi and Schmitz^{1*} are all there to be found in Tirupur cluster. They are: "extensive collaborative arrangements in production... informal sharing of information, tools and equipment... well functioning local institutions... labor markets... informal artisanal and credit arrangements". It is due to the aforesaid characteristics that the dynamic expansion of this industry has been possible.

Cawthorne^{2**} brought out that Tirupur's success had a great deal to do with the easy availability of cheap labor. But for Tirupur's global success, when similar advantages are available in several other clusters in India as well, it is not a sufficient explanation. This town has a long history in the cotton knitwear sector and specialized sectoral knowledge and technical know-how which have coalesced locally over the years. All that helped the Tirupur knitwear production find its way into the world market.

Some of important factors that have led to the growth in response to the competitive environment are listed as under;

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This factor is the single most important factor that has helped the industry transform from being one time an insignificant exporter of knitted vests (banians) to become a dominant and multi-product exporter of cotton knitwear garments. With the demand for quantity and quality (with high value addition) limited in the domestic market, the cluster did not take the route to fighting down each other and catch a low end route to short term success by merely cutting down cost and producing more of qualitatively inferior products.

The merchant-exporters and manufacturers in the market have been proactive. On the other side, turning to the industry one finds diversification of products in terms of quality and design as advancing to meet the export requirements. Thus the industry reacted positively to support the initiative. The expansion of market in terms of number of buyers and countries targeted is still in progress. Exports form the main plank on which all progress is based. To beat the quota system, exporters have started moving to items that do not come under MFA restrictions and within the quota categories and to the higher end of the market where realizations are better.

^{1*} Nadvi Khalid and Herbert Schmitz-Industrial clusters in Less-Developed countries Inst.of Dev.Studies.

^{2**} Cowthorne, Pamela M. - "of Networks and Markets" World Dev. Vol 23 No.1

Inter-firm production arrangements :

The second most important factor that has helped the industry is the usage of inter-firm production arrangements that were necessitated mainly by economic reasons. Hosiery, textiles and ready-made garments as in the case of metal working involves a series of processes each involving specialization which provides a conducive environment for the development of subcontracting relationship among the firms. Many of the small firms have been working under common ownership. Through subcontracting both horizontal linkage and vertical integration have been possible to be worked very successfully.

Leading to an active social system :

The industry of Tirupur has taken full advantage of this structure to develop and build upon the specialization of these firms to create an active 'social system'. There are actors, agencies and institutions playing their respective roles and exerting their influence to make the social system work. The industry associations took up the task as an informal conflict resolution mechanism. This sowed the seeds of co-operation along with competition which is a natural phenomenon of inter-firm commercial rivalry. This extensive co-operation makes the entrepreneurs, workers and other support enterprises play their roles in unison for a common target of acceleration of growth. The end product therefore becomes more of a social than an economic product here. It has come to be known that efforts to duplicate the Tirupur success in places like Madras, even by taking artisans and craft masters from Tirupur, have met with failure.

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6. Conclusions and Recommendations

Major issues and conclusions :

The single most important issue concerning the industry is whether it will be possible for it to sustain the growth rate as in the past. If so how?. With a rich resource base of cotton in India and existence of the large yet untapped international market, there seems to be no constraints both on the demand and supply side. The internationally regulated quota system under the MFA remains a stifling point and there is little that seems possible to be done about it except to produce the few non quota items and wait for the restrictions to get lifted over the next decade as provided for under the framework of erstwhile GATT. Despite this constraint, further industrial growth will however create its own infrastructural and organizational problems. The immediate among the infrastructural problems are as follows;

a) **Infrastructural problems :**

- i). **Water scarcity :** Washing, re-washing, bleaching and dyeing operations require good quality soft water in sufficient quantity. In Tirupur, the underground water has been polluted by the industry effluents. Water now needs to be transported in lorry trucks from adjoining villages. The solution lies in usage of low water intensive technology and in treatment of effluent water in order to recycle it. There are 600 bleaching and dyeing units in the industry which discharge the effluent water containing acids, bleaching chemicals and dyes thus damaging the already scarce water resources.

- ii) **Road infrastructure :** With the growth of industry, road transportation has become congested especially with the heavy movement of trucks on the important roads leading out of the city. A municipality scheme exists for laying the inner and outer ring roads around Tirupur for de-congesting the traffic. However, resources are not easily available for the same. A request has also been made to the state government for widening of national highway linking Coimbatore with Avinashi by four lane traffic roads. Another request to widen the direct road from Tirupur to Coimbatore via Vanjipalayam and Somanur is also pending.
- iii) **Power infrastructure :** With the result of high consumption of electric power, breakdowns and unscheduled power cuts are rampant. To overcome these problems, almost every firm has installed a standby electric generator set.
- b) **Organizational problems :**

The second issue pertains to the organization of the cluster. The inter-relationship due to a high degree of subcontracting is one of the major strengths which the success of the cluster has been attributed to. But with a further growth, especially in terms of quality improvements and value addition, there will be pressures on the existing framework with the increasingly changing demands. For the various stages of production, firms will have to cope up with changes in technology, upgradation of manpower skills and unite to resist not only the adverse regulations at national but also at the international level. Will the present structure of the cluster be able to cope up with changes or will it lead to alterations thereof ?

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Some of the manufacturer exporters have already set up their large integrated units with high capital investment beyond the small scale industry limit in order to carry out almost all the operations under one roof except for the knitting operation. This is legally feasible since the firm that undertakes the required minimum level of exports are not regulated by the reservation policy on small scale industry. If that is an indicator of loss in confidence in the existing production structure of the industry, then the role of extra commercial institutions and bodies comes under scrutiny and may need up-gradation in order to facilitate the same cluster structure to carry on with the sustained growth.

However reviewing the phenomenon of integrated units coming up where most of the manufacturing operations are carried out under single roof, it is estimated that the number has gone up substantially from a mere 5 to 150 in the last 6-7 years. The investment size of each of this unit is in the range of Rs. 3 to 5 crores. The size does not seem to be a function of quality of product nor reliability of timely delivery of the goods. In fact, due to the fast changing fashions, obsolescence rate of some of the equipment such as embroidery machines can be very high which discourages heavy investment in a single unit. The phenomenon is largely stated to be so because of easy availability of long term finance and large internal accruals. Besides, the high cost of machinery for some of finishing operations, pollution control equipment and machines capable of producing varied designs has led the investment levels to be generally high.

Recommendations : In light of the problems highlighted and suggestions made by the entrepreneurs and local institutions, the recommendations have been drawn. Some of the steps

that need to be taken to remove the infrastructural and organizational deficiencies may come through only in the long term. In the short to medium term, the industry could and is already contemplating to move in to high value added market segment by way of steps given as under.

Medium to short term solutions :

1. **Assist the industry to shift into high value items :** International catalogues providing insights into new fashions, new ranges of apparels are very expensive for individual firms to afford. Assistance needs to be provided for upgradation of the library facility already available in the SITRA office at Tirupur. There needs to be a strong coordination on this with Tirupur Exporters Association.
2. **Catalyze development of design capabilities :** Computer aided design (CAD) systems are internationally used for creation of new designs. Such facilities have been set up in-house by some of the very large exporters in Tirupur. It is felt that in the long run, private facilities will also be set up by entrepreneurs in order to provide the design services to all exporters on commercial basis. The existing problem relates to lack of skills and risk on returns. Technical assistance from National Institute of Fashion Technology be sought and financial assistance at subsidized interest rates from the financial institutions such as SIDBI be provided to the first few entrepreneurs willing to set up such services for job work on commercial terms.
3. **Helping expand geographically into other export markets :** With the coming up of computer based information services, access to the world wide latest information has become instantaneous. Besides the macro trade information about the trends and direction of trade, investment & technology, the services are also used for match making among the individual enterprises. These types of services still do not exist in Tirupur. There is a need to play a pro-active role to institute such services through common facility center for a period of 3 years, preferably in TEA office. The services could then be privatized on commercial basis once the private entrepreneurs take up such services on a wide spread scale. Initial technical assistance be sought from 'TANSTIA-FNF center' based in Madras, 'National Small Industries Corporation' (NSIC) and 'Federation of Indian Chamber of Commerce & Industry' (FICCI).
4. **Developing cluster to cluster co-operation at international level :** The cluster of hosiery in Tirupur has already moved into high degree of dynamism so that linkages for co-operation with other similar clusters are likely to be sustainable and mutually beneficial. This would help them to keep abreast of the latest trends in technology, markets, consumer tastes and designs. Besides, it would help the existing support institutions related to this cluster in developing new ways to help service their members and their target industrial units. One such corresponding cluster in Italy is Karpi which is famous for its cotton knitwear and high value added items. The synergy of using the strengths of rich cotton base and high level of skills in India with better designs, technology and market linkages from Italy can work to the advantage of both trans-national clusters.

5. **Technology up-gradation** : A direct consequence of expanding into high value items will lead to up-gradation of technology for the various firms at different levels. The up-gradation of technology seems especially required in dyeing, designing and fashion technology. The technology up-gradation has to be selective to the extent that it adds value for the enterprises through catalyzing the environment. Demonstration effect is one such solution since the initial step is usually the most difficult in to be taken technology advancement.

Support in the form of subsidized interest rates or zero interest rates should be provided by institutions such as SIDBI to finance the first few machines in the private sector that will be used for job work. These ventures, instead of appraising them on purely commercial considerations should be looked at as quasi development ventures. This type of support will provide a strong demonstration effect for the other enterprises that can then afford to buy the equipment on their own either for their in-house requirements or for job work purely on commercial terms. Such machines like the HTHP, Mercerized units, computerized color matching systems and Soft flow machines for dyeing need to be financed. There is presently only one HTHP and Mercerized unit set up in Tirupur. Such machines will lead to the usage of only one third of the existing level of water required, reduce energy consumption and develop the quality standard. Setting up of computerized color matching systems would also lead to reduction in the wastage of dyes that takes place due to hit and trial method of mixing in an attempt to get a correct shade.

6. **Improvement in labor productivity** : The future of knitwear industry depends on its capacity to accelerate the pace of modernization, improve quality and productivity which will help to reduce costs since there is no control over the prices of cotton yarn, the main input as also the output prices since competition from other neighboring countries brings down the international prices. Waste control needs to be exercised. All this will require concentration on developing the skills of manpower, both entrepreneurs and labor. The range and depth of training programs needs to be expanded and imparted through local institutions. New programs are sure to familiarize the labor with the use sophisticated machines and their technology.

The type of training programs which are required to upgrade the skills of manpower needs targeting at all the intermediate processes such as knitting, bleaching, dyeing, calendering, printing, and packaging. A comprehensive package of such programs on quality control, testing methods and export documentation needs also to be developed. The exporters need to be assisted to obtain the ISO 9000 series accreditation so that not only the technology and skills are improved but the management systems are also upgraded.

7. **Small scale industry definition be broadened** : For the many firms that are not exporting directly, acquisition of high end machines with massive capital investment will prove difficult due to the small scale industry definition which limits the investment on plant and machinery to Rs. 60 lakhs. For example, one soft flow dyeing machine which provides superior dyeing finish to the fabric and also consumes only one third of

the water otherwise required, needs an initial investment of Rs. 200 lakhs, more than three times the limit.

8. **Assistance for pollution control facilities :** With the assistance of the Government of India and institutions such as UNIDO and UNDP, tie ups with international institutions for pollution control facilities should be arranged. This will help in facilitating the setting up of common effluent treatment plants.

Long term solution :

Being dynamic and competitive is not a one time activity. It is important for some one to keep a close watch on the latest developments that take place especially in an industry that is dependent on exports based on fashion designs, international regulations (such as control on azo dyes) and fast pace of technology developments. A clear review for diagnosis then leads to implementation of the solutions through several ways which need to be institutionalized. An association, howsoever futuristic it may be, will not be able to implement all the programs that need be, especially when the type of organization structure and capabilities required are going to be in variance. This calls for the setting up of an institution to steer the industry through global competitiveness, the details of which are given in the following paragraphs. Secondly, industry cannot develop in isolation to the growth of society around. There is need to provide thrust to upgrade the basic education level among the people in and around Tirupur that will help to develop a mutually beneficial relationship and provide conducive environment for growth and development. Several workers coming from the adjoining villages develop the skills to work but are bereft of the basic education. This task of mass literacy must be shared among all the associations.

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Considering the needs of industry in future, TEA has already proposed to set up an institution for fashion designing for which funding assistance has been sought from the government and other national institutions. Part of such assistance from the Government of India, Small Industries Development Bank of India as also from the internal resources of the TEA have been committed.

The institution will offer courses on knitting technology, knitwear designing and knitwear making. The stated objectives of the institute are;

- λ Mass training of skilled persons for various operations in the industry
- λ Development of creative man-power for fashion designing
- λ Development of supervisory and middle level managerial personnel for both technical and non technical functions
- λ Training of export marketing executives
- λ Theoretical and practical orientation for high level executives
- λ Design studio to help exporters in Computer aided designs.
- λ Testing facility center
- λ Applied research
- λ Interaction with industry to disseminate technical information

The institute that will be set up with a cost of approximately Rs. 3 crores will be governed by a body comprising of members from TEA, Ministry of Industry (GOI), National Institute of Fashion Technology (NIFT), Small Industries Development Bank of India (SIDBI), South India

Textile Research Association (SITRA), Government of Tamilnadu and National Small Industries Corporation (NSIC). The day to day activities will be carried out by Executive Director who will be under the control of the governing council.

The original project cost for setting up the institute has since been revised and TEA is looking for additional fund support which could come from the international institutions even. Discussions should be arranged to understand the implications required thereon to support such activities.

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ANNEXURE

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List of Important Institutions/ Associations

1. Tirupur Export Knitwear Manufacturers Association, 597, Kamraj Road, Tirupur.
2. South Indian Hosiery Manufacturers Association, SIDCO Industrial Estate, Tirupur.
3. The South India Textile Research Association, Coimbatore.
4. AEPC-SITRA Knitwear Service Center, 1, Indira Nagar, III Street, Tirupur. Tel. 748 412.
5. Tirupur Exporters Association, 10, Appachi Nagar, I Street, Tirupur.
6. Banian Cloth Manufacturers Association, 47 Anna Nagar, Tirupur.
7. Tirupur Dyers Association, Binny Complex, Tirupur.
8. Tirupur Printers Association, Binny Complex, Tirupur.
9. Apparel Export Promotion Council, Hurunthmpalayam, Tirupur
10. District Industries Center, Coimbatore.
11. Small Industries Service Institute, Coimbatore.

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List of Abbreviated used

AEPC	Apparel Export Promotion Council
CAD	Computer Aided Design
CETP	Common Effluent Treatment Plant
FICCI	Federation of Indian Chamber of Commerce & Industry
GATT	General Agreement on Trade & Tariff
GOI	Government of India
MFA	Multi Fibre Agreement
NIFT	National Institute of Fashion Technology
NSIC	National Small Industries Corporation
SIDBI	Small Industries Development Bank of India
SIHMA	South India Hosiery Manufacturers' Association
SITRA	South India Textile Research Association
SME	Small & Medium Entreprises
SSI	Small Scale Industry
TEA	Tirupur Exporters' Association
TEKMA	Textiles Exporters and Knitwear Manufacturers Association
WTO	World Trade Organisation

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Rs. : Indian Rupee with the current exchange rate in November, 1996 at US \$ = Rs. 35.