Chapter – 1

A Synoptic View of the Study

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Chapter - 1

A SYNOPTIC VIEW OF THE STUDY

1.1 Introduction

The Indian Textile industry is one of the oldest industries in the country and exhibits a very multifarious sectoral dispersal matrix with hand-woven and hand-spun sector at one end of the field and the capital-intensive sophisticated mill sector at the other, with the knitting sector and decentralized power loom coming in between. “Even in the organized sector, ‘Island of Excellence’ exists, using highly sophisticated information technology based equipment with facilities for Enterprise Resource Planning / System Application & Products (ERP/SAP) which are second to none in the world” (Office of the Textile Commissioner, 2006, p.1).

The Indian Textiles Industry has an overwhelming presence in the economic life of the country. It is not only providing one of the basic necessities of life but also plays a key role through its contribution to industrial output, employment generation and the export earnings of the country. As per the latest data, it contributes about 17% to the country’s export earnings, 14% to industrial production and 4% to the GDP. It offers direct employment to over 35 million people including a large number of women, Schedule Castes and Schedule Tribes (Ministry of Textiles, 2012). The growth and development of the textile industry is directly depending on the progress of the economy of the nation because it is the second largest contributor of employment after agriculture in India.

1.2 Indian Textile Industry – A Brief Snapshot

As a self-reliant industry, Indian Textile industry has an essential place not only from the production of raw materials to the delivery of finished products but also at every stage of processing with huge value- addition. Indian Textile sector can be divided into major sub-sectors which are given as below:

- The organized cotton/man-made fiber / filament yarn industry,
- Decentralized power loom sector
- The wool and woolen textiles industry
- The sericulture and silk textiles industry
• Handlooms
• Handicrafts
• The jute and jute textiles industry
• Textiles exports.

The Organized Cotton/ Man-Made Fiber / Filament Yarn Textile Industry

The Cotton / Man-made fiber textile industry is one of the biggest organized industry in India in terms of number of units and employment generation (nearly 1 million workers). Moreover, there are various other industries which depend upon this sector such as engaged in manufacturing accessories, machinery, ancillaries, stores, dyes & chemicals. As per (Ministry of Textiles, 2012, p 5), “there were 1946 cotton/man-made fiber textile mills (non-SSI) in the country with an installed capacity of 43.13 million spindles, 5, 20,000 rotors and 52,000 looms”.

Decentralized Power Loom Sector

The decentralized power loom sector is one of the essential segments of the Textile Industry in terms of generating employment and fabric production. It contributes 62 percent to total cloth production and offers employment to 57.44 lakhs persons in the Country. The power loom sector produces 60% man-made fabrics and more than 60% of fabric is sourced meant for export. The power loom sector fulfills the fabric need of home textile sectors and readymade garments thus, these segments are profoundly dependent on the power loom sector. As per (Ministry of Textiles, 2012, p. 107) “there were approximately 5.19 lakhs Power loom units with 22.98 lakhs Power looms as on 31.08.2011.”

Sericulture & Silk Industry

India is the second largest manufacturer of silk in the World. There are four varieties of Silk produced in India. During 2010-11, Eri accounts for 13.5% (2760 Million Tonnes), mulberry 80.2% (16360 Million Tonnes), muga 0.6% (124 Million Tonnes) and tasar 5.7% (1166 Million Tonnes) of the total raw silk production in the country. Sericulture is also an important agro-based and labour intensive cottage industry. It offers employment to around 7.25 million persons in semi-urban and rural areas in India.
The Jute and Jute Textiles Industry

The Jute industry occupies significant place in India being one of the major industries in the eastern region, mainly in West Bengal. It facilitates safe packaging as natural, biodegradable and eco-friendly product. The jute industry offers gainful occupation to 0.37 million workers in diversified units and in organized mills including allied activities and tertiary sector. There are 83 composite jute mills in India and the maximum installed capacity in jute mills other than 100% export oriented units are estimated to be of 2.47 million tons per annum (Ministry of Textiles, 2012).

Handlooms

Handloom weaving is one of the major economic activities after agriculture. This sector generates direct as well as indirect employment to more than 43 lakhs weavers and allied workers. It contributes about 15% of the cloth production in the country and also majorly contributes to the export earnings of the country. India manufactures 95% of the world’s hand woven fabric and its production stood at 6949 million sq. meters in the year 2010-11, which was about 26% over the production of 5493 million sq. meters in the year 2003-04 (Ministry of Textiles, 2012).

Handicrafts

The Handicrafts Sector plays a key role in the Indian economy. It not only offers number of jobs to craft persons in semi urban and rural areas but also create considerable foreign exchange for the country. This sector has suffered a lot due to the low capital, lack of education, absence of market intelligence, poor exposure to new technologies and a poor institutional framework. Despite, the sector has observed a noteworthy growth. The government has implemented various schemes during the current plan for the development of the sector.

The Wool and Woolen Textiles Industry

The Indian Wool Industry is one of the important sources of livelihood for the rural India which represents small, medium, and large scale units. It is relatively small compared to other textile industries in India but its product range is different from textile intermediaries to finished textiles, knit wears, garments, carpets, blankets and an initial presence in technical textiles. The Indian Wool Industry is the 7th largest in the world and it contributes about 1.8% of total world production of wool (Indian
**Wool Industry, n.d.**). The Indian woolen industry stands at Rs. 10,000 crore in terms of size which is broadly divided between the decentralized and organized sectors.

**Textiles Exports**

India’s textiles and clothing industry strongly supports the national economy and largely contributes to the India’s exports worldwide. During the XIIth Plan, an export target of US$ 65 billion and creation of 25 million additional jobs has been proposed with a CAGR of 15%. At current prices the Indian textiles industry is valued at US$55 billion, 64% of which serves the domestic demand. The textiles industry accounts for 14% of industrial production, which is 4% of Gross Domestic Product (GDP); employs 35 million people and accounts for nearly 12% share of the country’s total exports basket (*Ministry of Textiles, 2012*).

1.3 Changing Profile of Textiles

The following chart 1.1 shows the Changing Global Textile Consumption

**Chart 1.1: Changing Global Textile Consumption**

![Chart showing changing global textile consumption](chart1.png)


In the global set-up, the textile consumption has shifted from the traditional textile to **technical textile** as shown in chart 1.1. There has been a sharp increase in the global demand for Technical Textiles due to its functional requirement like health & safety compliance, cost effectiveness, durability, high strength, light weight, versatility, customization, eco friendliness, user friendliness, logistic convenience etc. The traditional production techniques like weaving looms, ring spinning, have been
supplemented and strengthened with newer production technologies with higher speed and automation in order to produce "Technical Textiles". The global technical textile consumption in 2010 stood at 23 million MT, which has grown at a Compounded Annual Growth Rate (CAGR) of 3% since 2007. USA, Western Europe and Japan are the major consumers of Technical Textiles, which together constitutes 65% of the world consumption of Technical Textiles. China accounts for 15%, whereas India contributes only 8.6% to the total global consumption (Ministry of Textiles, 2011).

Chart 1.2: Distribution of Indian Technical Textiles market (2010-11)


The largest segments of Technical textiles produced in India are Home tech, Cloth tech, Pack tech and Sportech as shown in Chart 1.2. Hometech is the third largest segments and the key drivers of growth for the technical textile industry. Home tech segment is largely concentrated in the unorganized and small scale units as it mainly comprises commodity products which are not very research and development intensive. In other segments, most of the products are imported because the Small and Medium Enterprises (SMEs) do not have ability to invest in product innovation and research and development, which are the key success source for high tech products. Packtech, Clothtech and Hometech are the largest segments in the overall market. These segments accounts for about 2/3rdof the market size, on the other hand, the share of Oekotech, Geo tech, and Agro tech is very in significant. In
the next decade, the future of the Indian technical textile industry is expected to be determined by the performance in the area of Hometech textiles. But for various reasons, the industry is unable to enhance its growth in India like lack of research & development, low penetration of the sector and lack of technology know-how etc.

**Hometech Textiles:**

The Hometech textiles are the improved quality of the products or materials that satisfy various needs of the people like cost effectiveness, durability, light weight, high strength etc which cannot be met by traditional home textiles. This is the new sector which is still not very familiar to the general public though, hometech textiles are used in a domestic environment such as interior decoration carpeting and furniture, cushion materials, textile-reinforced structure/fittings, floor coverings and fireproofing. It is an actual problem for the growth of the industry that peoples are not aware of the term ‘Hometech textiles’ despite of its increasing consumption and use. Home tech Textiles has been gradually gaining its importance in India but its contribution in the global technical textile industry is comparatively trivial. However, it has become an important part of Indian Textile Industry thus government of India has taken various initiatives through several schemes for the growth and development of Technical Textiles in the country.

**1.4 Traditional Home Textiles v/s Hometech Textile Markets**

The traditional home textiles market trend is profoundly inclined towards countries with cheap labor. In this scenario, hometech textiles give a chance to the companies in the industrialized countries to survive the competition and to attain sustainable growth due to their specialized materials, skills, equipments and processes.

There are certain basic differences between Hometech Textiles and Traditional Home Textiles industries:

1. Hometech textiles are more expensive than the traditional home textiles because of their high precise performance quality.
2. The accepted testing methods are used by the Hometech textile manufacturers to achieve customers' faith regarding standard specifications.
3. As opposed to mass market, Hometech textiles are for a different segment of a market. Hometech textile manufacturers need to be stretchy in their production
schedules because this target market desires more flexible and smaller production spells.

4. Hometech textile manufacturers have to invest in newer equipments and research and development because these textiles stay alive on innovations.

5. The legal necessities have to be followed by the Hometech manufacturers in some of the certain categories of hometech textiles.

1.5 Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of the Indian Hometech Textile Industry

Strengths

1. Textile industry has a strong base in terms of raw materials, skilled man power, low wages and entrepreneurial talent which can be leveraged to boost the hometech textile sector (Ministry of Textiles, 2011).

2. India has presence in Textile Research Associations (TRAs) with strong expertise in technical textiles which can also be contributed to Research and Development (R&D) of Hometech products.

3. The implementation of various schemes by the government of India like Growth and development of technical textiles (SGDTT) and Technology Mission on Technical Textiles (TMTT) are helping great to boost the hometech textile sector.

4. There are number of Indian Institute of Technology (IITs) / Textiles Institutes and eight Centers of Excellences (COEs) present in India i.e. Bombay Textile Research Association (BTRA) for Geotech, Synthetic and Art Silk Mills Research Association (SASMIRA) for Agrotech, South India Textile Research Association (SITRA) for Meditech & Northern Indian Textile Research Association (NITRA) for Protech, Ahmadabad Textile Industry’s Research Association (ATIRA) for Composites, Society's Textile & Engineering Institute, Kolhapur (DKTE) for Non-Woven, PSG College of Technology, Coimbatore (PSG) for Indutech and Sportech for providing latest testing facilities national / international accreditation, information centre, facilities for training, prototype development facilities etc. which can also extended their activities and provide testing facilities to Hometech products.
Weaknesses

1. Indian Hometech textile industry is dependent on import of technology and machinery for most of the high-end hometech textiles products.

2. India has abundant resource for home textiles but these available resources have not been enlarged and updated with changing trend in application of technical textiles with particular reference to hometech textiles.

3. Skilled man power is not available for hometech textiles in India.

4. India produces most of the items of hometech textiles industry, but they are not very R&D intensive.

5. There is an absence of expert consultants in India for Hometech Textiles which could provide guidance to entrepreneurs.

6. There is a lack of regulatory measures for usage of Hometech textiles.

7. There is a lack of support for export promotional activities.

8. The support for contract R&D is not available in India.

9. The high performance specialty fibers are not available indigenously for the manufacture of hometech textiles.

10. There is no single centre of excellence for Hometech segment.

Opportunities

1. India has vast market potential for Hometech textiles.

2. Rising incomes and increase in the number of addressable households has driven the growth in hometech segment. This is also proved by the ever increasing imports of Hometech products in the past decade.

3. India has extremely large export potential for hometech textiles.

Threats

1. India imports hometech textile items from other countries like China at cheaper rates which threaten the domestic industry.

2. India’s bilateral and multilateral agreements particularly with developed countries like United States of America (USA) and European Union (EU) create hurdles for the Hometech textiles industry.
1.6 Statement of the Problem

Technical Textiles is an important part of the textile industry and its growth will have an important bearing on overall growth of the textile industry. In spite of the fact that the growth of the technical textile industry would necessarily meet the specific physical and functional needs of the consumers and would create additional employment opportunities in coming years, it is disheartening to note that India does not find significant place for its global consumption by way of production or consumption in this sector at present. However, the growth of small & medium enterprises in the Technical Textiles sector has been very significant. As on date there are 3000 units manufacturing technical textiles in the country, of which about 90% are in SME sector; and around 1000 units have commenced production during the last 5 years (Ministry of Textiles, 2010).

Hometech is one of the largest segments and the main drivers of growth for the technical textile industry. Thus, it becomes important to find the progress of the Hometech industry in the past decade. The secondary data signify that there has been an improvement in the production, exports and imports of the Hometech industry but there is a lack of research evidence in India with respect to the analysis of growth and development of the industry. Another relevant problem is that there has been poor data collection on the part of the Ministry of Textiles. Data on production of the industry is not available for the years 2008-09, 2009-10 and 2010-11.

The present study is a modest attempt to measure the growth of the Hometech Industry in India and find out to what extent it has been developed. The issue is whether the existing government policies were effective enough to accelerate the growth of the industry and in turn improve production and trade. The study strives to find out the extent of the growth of the industry and whether it has been significantly increased to meet the domestic consumption. For the purpose of study, the period of past Ten years is taken in to consideration to analyze the performance of the Hometech industry.

A macro study has been taken to measure the growth of the industry in terms of broad parameters. Since, there is a gap in secondary data, at the same time a micro study is under taken to analyze the financial performance of the Indian Hometech companies in Tenth and Eleventh plan which in turn help to assess the growth of the
industry. It is hoped that an analysis of financial performance of the companies would reveal their profitability, turnover, solvency and liquidity. The study will find out the reasons for the low growth of the industry and will also suggest the measures to promote the growth of Hometech segment in India. Hence, the present study titled “Growth and Development of Technical Textiles in India: a Case Study of Hometech Industry” rightly attempts at analyzing the growth and development of Hometech industry in the past decade.

1.7 Literature Review

The review of literature structures a vital part of the research because it deals with critical examination of various published and unpublished works related to the study undertaken and estimate the existing research gap. Therefore, a brief review of various article, papers, presentations and books related to the Technical textiles and Hometech textiles in India and abroad has been done below in order to discuss the uniqueness of the present study. Following is the list of published work which helped the researcher to find the research gap and work further to bridge that gap.

Gosavi, Wadsworth, and Duckett (1994) authored a paper on “Non woven Laminates containing cotton for medical applications” which reveals the application of cotton textiles in medical areas so as to achieve best results required for today’s protective clothing. The material with high cotton content are replacing with reusable synthetic fabric items in medical applications because it provide better barrier performance and more eco-friendly disposable products.

Horrocks, and Anand (2000) in their book entitled “Hand Book of Technical Textiles” endeavored to show the production technologies of various Technical textiles raw materials and end use products. The book also gives a general idea of global Technical Textile market covering its scope, milestones in its development, textile processes, applications, globalization and future of the industry. It is concluded that technical textiles industry enjoyed a fast and rising awareness of its existence by the outside world in 1980s but got more mature in 1990s in terms of commercial development and consolidation as fiber producers and textile manufacturers alike concentrated on overhauling and refocusing their businesses in the wake of world recession. The new millennium assures even fiercer international competition would compel the manufacturers to engineer costs downwards and develop global economies
of scale in production and product development. Technical textiles will turn out to be improved ‘value for money’ than ever before and this should open the way towards additional applications as existing end-uses mature.

Nemoz (2001) in a presentation on “Applications and markets of Technical Textiles: Actual situation and Trends” discussed the steps of designing of a technical textile products, end users of Technical Textiles and four main classes of functions for technical textile such as mechanical functions, exchange functions, functionalities for living beings and protective functions. The author is of the opinion that distribution of the Technical Textile knowledge entails a multidisciplinary approach for all future engineers, textile technicians, engineers or managers. The paper also suggests some keys for driving forces, building the most powerful supply chain and transferring the knowledge at all levels in order to make future bright in Technical Textiles.

Dattilo, King, Cassill, and Leung (2002) in their paper “Medical Textiles: Application of an absorbable barbed bi-directional surgical suture” report the use of an absorbable bi-directional barbed surgical sutures in a range of different surgical procedures. The most important feature of barbed suture is that it does not require knots and it does not need to be removed for wound closure. It is summed up that the barbed suture reduces problems related to current sutures on the market. So, this new polymer product will have an indicative effect on the future wound closure industry.

Johnson (2003) in the paper entitled “High-tech fibers for Technical textiles” throws light on the increasing use of high-tech fibers in technical textiles. The author cites the background of fibers when the concept of long-chain molecules passing through both crystalline and disordered regions of structure were introduced and also reveals the present picture of high-tech fibers that shows the improved relationships between tensile properties and structure.

Chi, Kilduff, and Dyer (2005) in their paper “An assessment of US comparative advantage in Technical textiles from a trade perspective” evaluate the changes in international competitiveness of the US technical and industrial textile sector with time. The authors used the method of Balassa’s Revealed comparative advantage (RCA) for the detailed examination. They compared the US trading with nine leading textile partners (yr. 1992-2002), which results that high-income countries have a strong trade position in high-tech products whereas medium and low-income
countries are enjoying strong position in lower-tech products. US have a revealed comparative advantage in high-tech products while it has a revealed comparative disadvantage in lower-tech products. The finding shows the leading position of US in sophisticated technical and industrial textile products.

**Ministry of Textiles (2006)** presented a paper on “Technical Textiles with focus on the use of Geo Textiles” in National advisory council (NAC). It shows the market size and applications of Geo textiles in India. The results of the study suggest that geo textiles are an efficient substitute for traditional sand blanket course and also very cost effective when good quality sub base materials are not available within economic lead and California Bearing Ratio (CBR) of sub grade is low i.e. less than 3. Ministry of textiles emphasized its mission for the promotion of Technical Textiles and covers various initiatives taken by the government of India in order to develop this sector. The presentation conclude that the simple usage of Geo synthetic will not only provide good performance but also serve proper selection, correct design and quality assurance.

**Teli and Kumar (2007)** in the paper entitled “Technical textile- Functional textiles and apparels” discuss the significant importance of functional textiles and apparels which indicate Meditech and Protech as the two main branches of the Technical textile segment for the considerable growth in fast developing countries like India and China. The applications of nano-technology based functional textiles are also covered in this paper. As per the given market size of Indian Technical textiles during the years 2003-04, 2007-08 and the forecast of world Technical textiles consumption during 1995-2010, we concluded that India and China being developing countries have 19% and 5% of the textile industrial production in terms of Technical textiles respectively.

**Chaudhary (2007)** in the paper on “Technical textiles-an evolving stage in India” has discussed the impact of post Multi Fiber Agreement (MFA) period on Indian textile industry. Post MFA period has brought relief to the developing countries but it made the competition tough due to the cost competitive and low quality products. The author observed that in spite of strong base of Indian textile industry in the world, its presence in technical textiles is negligible. The reason behind this negligence is the requirement of expensive equipment and skilled workers for producing the technical textile products, which are concentrated in developed
countries. However, India meets the consumption of technical textiles by imports from the developed countries. So the government is also interested in promoting this segment and has taken various initiatives to remove the backwardness of the technical textiles in India. It is inferred that India can develop its base in Technical textiles because of the abundance of raw material and cheap labor but there is a need of concentration of both government and private sector.

Rakshit, Hira and Gangopadhyay (2007) in the paper on “Technical Textiles: What India needs to do now” state that Technical textile is a potential area for the development of textile industry in India. The authors have observed a slow but perceptible sign of growth of Indian technical textile industry in a few specialized fields. The paper covers the Technology Up gradation Fund Scheme (TUFS) launched by government and some strategies required for the promotion of technical textiles in India related to application areas, raw materials, manufacturing facilities, R&D and Quality assurance, centers for excellence, market development and literature, standards and information technology.

Memon and Zaman (2007) in their paper entitled “Pakistan lags behind in Technical Textiles” attempted to show an overview of Technical Textiles in Pakistan. It demonstrates the technical and economical impact of technical textiles in the industrially developed countries and their future contribution for the development of developing countries, such as China, South East Asia, and North Africa etc. The authors expected that the development of technical textile markets will be basis for the development of economies of scale in production and product development in near future which arouse the need for developing countries like Pakistan, India and China to improve its technical know-how, quality standards at every stage with reduced costs and use of eco-friendly products in order to improve the growth of Technical Textiles.

Singh (2008) in a presentation on “Emerging Indian market trends in Technical Textiles and nonwovens” states the segment wise present status of Technical Textile and Non-woven Industry in India. The author also highlighted various initiatives taken by the government of India for encouraging the growth of the industries. It is concluded that the production and consumption of technical textile and non-woven items in India is increasing very speedily due to the growth in the economy and
government’s initiatives. The disorganized changes in conventional textile industry have also encouraged diversification in technical textiles.

Ye, Hu, and Feng (2008) authored a paper on “Development of the warp knitted spacer fabrics for cushion applications” which presents the increasing use of warp-knitted spacer fabrics as cushion in car seats. The paper shows the superiority of warp-knitted spacer fabrics over the PU foam by comparing its characteristics that exhibits three kinds of qualities of spacer fabrics namely air permeability, heat resistance and pressure distribution.

Anand (2008) in a paper on “Designer natural fiber geotextiles- A new concept” describes the development in flat weft knitting technology which is used for the production and designing of novel natural fiber geotextiles with its interactive behavior in different types of soil conditions. The author observes that the vegetable fiber yarn have high modulus, high strength, low elasticity, low breaking extension, much more environment-friendly and biodegradable, which make possible to produce strengthen geotextiles. The flat weft-knitting machine is redesigned to enable very rough and absolutely straight natural fiber yarns to be included into a geotextiles structure. The geotextiles made by the knitted and woven vegetable fiber show the best results and have superior qualities over the mid-range of synthetic geotextiles for soil reinforcement.

Chakrabarty (2008), in the paper entitled “Indian Technical Textiles prospects” reveals that the consumption of Technical Textiles in India is insignificant but it attains the growth rate of conventional textiles. The author suggested the basic consideration for the Technical Textiles production and presented the various techniques that convert the textiles into products i.e. nano technology, knitting, braided structure, coating and laminating etc.

Kumar (2008) authored a paper entitled “Technical Textiles” which discuss the importance of High performance textile in the era of innovation, modernization, infrastructure, development, chemical industry, medical application, automotive industry, irrigation, agriculture & aerospace etc. It is found out that the Indian Textile industry have a strong base in terms of manpower, resources, machinery, equipment, testing and processing despite it is lagging behind in updating research and development which is the major reason for trivial consumption of Technical Textiles
in India. The study gave the conclusion that India will grow rapidly and will have the advantage of manufacturing technical textiles than other countries due to low cost of production but need is to proper selection of raw material, process, machines and implementation of successful innovation and design.

Marimuthu (2008) in the presentation entitled “Business Opportunity for Nonwovens & Technical Textiles in India” focused on the growth factors for India to become next big market for Technical Textiles and Nonwovens. The given status of Technical textile and nonwoven industry in India concluded that Indian market for these industries are at infancy stage but the market size in the past year shows that it has huge growth potential. The demand for Technical textiles and nonwoven products are rising rapidly due to the growth of organized retail market or mall culture and domestic housing boom. The author expected that India will be like Italy in 2012 and will be better than Europe by 2022 and US by 2042. The presentation also offered some suggestions for the entrepreneurs in order to develop its business in Technical textile and nonwovens.

Ramkumar (2009) in the paper entitled “Why Technical textiles is the next phase of the Indian textile industry” reveals the significance of Technical textile industry in India for providing economic stability, growing domestic and export markets. The diversification of Textile industry in technical textiles needs to create awareness and developing knowledge about the technical textile products. The center of excellence requires some suitable actions for the development of R&D activities in the manufacturing of technical textile products.

Ramkumar (2009) in the paper entitled “Compelling case for the Technical textile sector in India” explains that Indian textile industry needs a new IT (Indian textile industry) revolution to encourage, support and growth. The author describes the reasons which force to energizing the Technical textile sector in India which are: (a) technical textile sector helps to increase the economic and GDP growth, (b) due to the lack of availability of raw cotton for the textile industry entrepreneurs need to focus on technical textile products and (c) technical textile fulfils the needs of growing domestic and export markets. These reasons supports to conclude that scarcity of availability of raw material and skilled labors are the two big reasons, which divert the attention towards Technical textile sector.
Ramkumar (2009) authored a paper “Technical textiles cluster development is the way for growth” which states that India needs to focus on three important sectors for accelerating the economic growth namely service, manufacturing and agriculture. Among these three sectors the author has made an attempt to explain the significance of manufacturing sector and within this sector Textile industry is taken as an important segment in India. Textile industry occupies important place in India therefore, the textile industrialists, policy planners and entrepreneurs need to concentrate on manufacturing of Technical textile products to encourage the growth of Indian textile industry.

Ramkumar (2009) in the paper entitled “Technical textiles: Growth tools for textile industry” articulate the significant role of Technical Textiles industry for gearing the growth of Textile industry as well as maintaining sustainability in all aspects of the country i.e. environment, energy and economy. ‘Sustainability’ is an act of making policies around the world to limit the temperature rise to 2°C as a way of sustaining the planet as we inherited and leaving it for future generation. As the Technical Textile industry is mainly engaged in producing single-use and synthetic fibre based products therefore, the author is of the opinion that it is opportune and significant for the industry and trade associations representing the industry to come up with guidelines for the sustainability aspect of the industry. In addition, the paper covers various new market opportunities for the Technical Textile industry in the field of air pollution reducing products such as air filters and face masks, cost effective filtration products, recycled polypropylene spun bond bags and some new eco-friendly products. The author pointed out that India is compatible for the growth of nonwovens and industrial textiles sectors, which is good for the industry in developed nations because it will enhance the trade. The nonwovens and the technical textiles industry in the developing nations may provide as suppliers for convertors in North America and Europe, which will consume some portion of the market that is currently held by roll goods producers in North America and EU. It is concluded that India can produce goods at competitive price due to the availability of natural and regenerated fibres, relatively cheap labor and fairly supportive Government schemes but need is to stay nimble and Invest in R&D..

Parthasarthi (2009) writes a research paper on “Application of Acrylic on Home textile” which examines the application of acrylic on bedcovers. To test the
proficiency of acrylic yarns, 100% acrylic bedcover has compared with 100% cotton bed cover. The test showed the superiority of acrylic bed covers over the cotton bed covers because research proved that acrylic bed covers have better feel, take up more dyes, more comfortable, gives bright shades, easier bending deformation, higher water vapor transfer, higher water retention ability and superior water transport properties in comparison of cotton bed covers.

Vengsarker (2009) writes a paper on “Polypropylene staple fiber for specialized Technical textiles application” which examines the wide range application of polypropylene fiber in Technical textiles. For testing the proficiency of polypropylene fiber in technical textile application, the author has compared the PP fiber with polyester, nylon, acrylic and viscose which results that polypropylene fiber is more resistant to chemicals, regains very low moisture, lowest specific gravity of all fibers, low thermal conductivity, has color fastness and good resiliency than other synthetic fibers. These properties are made capable the PP fiber to be applied in various segments of technical textiles i.e. geotextiles, meditextiles, filtration fabric and flame retardant non-woven.

A study of US Technical textile industry conducted by Chi (2009) on “Measurement of business environment characteristics in the US Technical textile industry: an empirical industry” elaborates the measurement of Business Environment Characteristics (BEC) with developing reliable and sound instruments in operations management. The study is based on one of the model of BEC frameworks that consist of four dimensions namely diversity, complexity, hostility and dynamism which proves the BEC model legally accepted.

Mangat (2009) in the paper “Technical Textile: A promising Future” attempted to give the guidance of entering in Technical Textile market and recommended that the developing countries should improve their share in this sector because of the increasing demand of Technical Textile. The author also observes a dominant share of developed countries in this sector because technical textile gives better return on investment.

Kothari (2009) authored a paper on “Technical Textiles- Growth potential and prospects in India” which points out that the government of India recognized the importance of Technical textiles in 2000 and decided to give priority while
implementing textile policy for the growth and development of Technical Textiles in India. The study shows the current status of world market and market size in India and highlights the areas where India can advantage significantly by adopting and developing applications of technical textiles. It is concluded that India’s presence in technical textile area is relatively small at present but it is expected that technical textiles in the country will grow at a significant rate during next 5 years.

The work of Chi (2010) on “A study of Trade competitiveness in the US Technical textile industry” identifies the impacts of major political and economic factors on the US technical textile export to its 15 major trading partners and examines the trade performance of US technical textiles with these trading partners over the period. The author employed ordinary-least-square (OLS) regression under a gravity model framework to construct the analysis. The result shows the increasing trend of US technical textile export with greater production which enables large supply for export. The outcome of the study reveals the competitive position and dominating trade performance of US in Technical textiles with its major trading partners.

Ramkumar (2010) in the paper entitled “Technical Textiles: Emerging Opportunity” identifies that the growth of nonwovens and technical textiles sectors are related to the GDP growth of nations. Therefore, developed economies such as the US, Western Europe and Japan have chased this pattern. But the author raised a question that Will India be different? Industry associations such as the USA based Association of the Nonwoven Fabrics Industry (INDA) predict a linear relationship between the GDP growth quantified by Purchasing Power Parity (PPP) and the growth of nonwovens industry. If this hypothesis holds good for India, India will certainly have a positive growth. The paper reveals that there are lots of opportunities in the technical textiles sector in India which need greater understanding and proper investments to enable growth. The author emphasized on two things which are suitable for the growth of India’s technical textiles sector: 1) Suitable technology utilization and 2) Communication. Moreover, paper covers the four important enablers which will help the promising technical textiles sector in India. i.e. growth in the economy, population growth and abundance of young population, rise in disposable income and need for diversification in the textile industry for its survival and growth.
Saxena, and Srivastava (2010) authored a paper on “Sunscreen shelter fabric- A review” which throws light on the significant use of textiles for protecting the skin against Ultra Violet (U.V.) radiations. The authors described the physic- mechanical, physic- chemical and chemical properties of the textile which are required for the avoidance of solar radiations. The development of effective sunscreen shelter fabric depends on fabric structure, UV blocking capability, weathering resistance, flexibility and flame retardation. The UV absorption of shelter fabric is influenced by some factors i.e. nature of the fiber, influence of dyeing and moisture content.

Nath (2010) in a paper entitled “Ballistic protection fabric and bullet proof vests” shows the application of high performance fibers in protective clothing to protect the individuals from grenades, mortars and artillery shells and improvised explosive devices. The article details the number of remarkable developments in the manufacturing of body armors and bulletproof vests so as to make them light weighted with excellent ballistic resistance properties. Recently, high modulus aliphatic nylon 6.6 with high degree of crystalline has been developed and widely used in body armors namely Kevlar, twaron, spectra and DSM dyneema.

Uglene (2010) authored a paper on “Recent advances in protective clothing technology” which details the modern development and their reasons in protective clothing technology made by Mustang survival, privately owned Canadian corporation. It is clothing industry but has made number of remarkable advancements in the field of protective clothing technology namely life preserver/ survival vest, National aeronautics and space administration (NASA) life preserver unit (LPU), NASA enhanced life preserver unit (ELPU), advanced life preservers, wind blast- life preserver/ survival vest, thermal protection, immersion suits, thermal under garments and integration. The details have supported the view that the Mustang survival corporation has good research and development capabilities.

Ibrahim, Eid, Hashem, Refai, and El-Hossamy (2010) authored a paper on “Smart options for functional finishing of Linen-containing fabrics” which examines the application of linen into the fabric surfaces for attaining high functional properties. The surface of fabrics is modified by using oxygen- or nitrogen plasma with selected ionic dyes, nano-scale metal, certain metal salts, quaternary ammonium salt so as to get linen-based textiles with upgrade UV-protection and antibacterial functions. The results show that linen-based textile gives much improvement in UV-
protection and antibacterial activity against G+ve and G–ve bacteria which is helpful in concluding that linen-containing fabrics are more durable, applicable, effective and give better antibacterial ability.

**Hall (2010)** in the paper entitled “Coating of Technical textiles” discusses the different types and techniques of coating for the application in Technical textiles. The article reports the detailed description of individual items which are used during the coating process. The background and developments of different coated materials namely fusible interlinings, adhesives and laminating have also been covered so as to present their performances and application in coated Technical textiles.

**Marimuthu (2010)** in the paper on “Why should Technical Textiles grow in India” analyses the reasons that will increase the growth of Technical textiles industry in India. The author recommends that the Indian Textile industry should diversify into Technical textile sector for earning more profit margins. He also suggests the factors that can attract investments in Technical Textiles.

**Ramkumar (2010)** in the paper entitled “Nonwovens and Technical Textiles in India: Current Scenario” tried to elaborate the current scenario of textile industry with its need for diversification into nonwovens and technical textiles sector, policy schemes and immediate opportunities. The author is of the opinion that the classification of the nascent Indian technical textiles into 12 segments is premature and would cause confusions. There are several products that can be suitable in many segments and such a classification for an emerging market may not be suitable. For the purpose of having an easier and useful segmentation from the point of view of marketing, he has proposed a three way classification of the technical textiles sector: 1) Consumer Products; 2) Institutional Products and 3) Government Procurement Products. The author explores the five needs for Indian Technical Textile sector in order to accelerate its growth which are: 1) Immediate need for the converting sector in India 2) Investing in high-end machinery 3) Educating and training skilled workers who can be employed in the growing Technical Textiles sector, 4) Creating knowledge on converting roll goods to end-user products and 5) Understanding marketing know-how and coordinated approach towards marketing.

**Singh (2010)** in a paper “India to grow faster in Technical Textiles” states that accelerated growth of the Indian economy will be favorable for the Technical
Textiles. The paper covers the market size and consumption of Technical textiles in India which shows that the Packtech, clothtech, Hometech and Sportech products of Technical textiles are largely produced in India.

Patel (2010) in the paper entitled “Technical Textile in India- A dormant volcano prepares to erupt” focused on factors which are responsible for slow growth rate of Indian Technical Textile Industry. The author throws light on supply side and demand side factors and gives suitable strategies for stimulating domestic demand for Technical Textiles. The paper covers the global scenario and market size of Indian Technical Textile industry and gave the conclusion that the current consumption of technical textile is 3% which is expected to be 11% which will lead to several benefits such as increase in export, increase in job opportunities, entry of large manufacturers and increase in investment.

Ramkumar (2010) in the paper “Technical Textiles in the changing economic landscape” focused on the Technical textile industry which is an essential textile item and source of connecting emerging economies with developed world. The author is of the opinion that India needs to enhance the technical textiles sector and requires to have a public-private partnership to create a dynamic converting sector for the technical textile sector in India which will help in creating job avenues for the Indian textile industry.

ICRA Management Consulting Services Limited (2010) displayed the presentation on “Prospects and Opportunities in Technical Textiles: Rajasthan perspective.” The main purpose of the presentation was to reveal the scenario of Technical Textile industry with a focus on Agrotech, Mobiltech and Geotech in Rajasthan perspective. It shows the factors that support the investment in the state such as market drivers, policy drivers and economic drivers and suggest various measures that would boost up the Technical Textile industry such as awareness about benefits of technical textile products amongst the private and institutional users, improving standards (focus Geotech), domestic availability of testing facilities, technically trained personnel and high performance and specialty fibers and proper regulations to promote usage of technical textiles.

Dhir (2010) in a presentation on “Stimulating Growth for Technical Textiles in India” emphasized on the factors responsible for the slow growth of the Technical
Textiles in India and also point out the ways that could stimulate its demand. It is concluded that India’s consumption for Technical textiles is quite low on the global map but the rate of growth of consumption is higher than most of developed countries. In order to fulfill the domestic demand for Technical textiles, manufacturers should educate the consumers, large number of manufacturers should be entered in the market that will result in price decrease, higher and highest quality talent should be attracted towards Technical textile industry, government should take steps for implementing regulations, investment in R&D and product innovation should be increased to enhance the consumption.

Marmarali (2010) in the presentation on “Technical Textile – The research and innovation challenge in the Mediterranean countries – The case study of Turkey” endeavored to show the status of Technical textile sector in Turkey. It reveals that Turkey is increasing rapidly in terms of Technical textile production similar to developed countries because of its various competitive advantages. It is a big technical textile supplier, importer as well as its investment is continuously rising but the amount of R & D is low in comparison with other OECD countries.

Reliance Industries Limited (2010) presented a paper entitled “Technical Textiles – Growth potential and prospects in India” which shows the Indian scenario of Technical Textiles. It emphasized on constraints for the growth of Indian Technical textile industry and gave reasons for the low consumption of Technical Textiles in India. It suggests various strategies for the promotion of this sector in India in terms of application areas, raw materials, specialty fibers, manufacturing facilities, R&D and quality assurance, domestic and export market development and fiscal measures.

Ramkumar (2011) writes a paper on “Technical textiles: A growing necessity for the Indian Textile industry” that reveals the need of the Technical textiles sector for its expansion in India. The author has proposed a classification of Technical textiles sector into three segments i.e. consumer products, institutional products and government products. He also point out the two reasons for the lack of growth i.e. lack of practical knowledge and lack of market know-how.

Gherzi (2011) in the presentation on “Technical Textiles- Raw materials & Technologies” endeavored to show the global and Indian scenario of Technical textile in terms of its past trend, raw material aspects and high growth technologies. It is
concluded that the India is in rising state and indigenous technical textile products are still underdeveloped in comparison of world average thus Indian Technical textile industry is import intensive. India has further prospective to make its strong base in Technical Textiles but the need is to expand new manufacturing technologies for the production of raw materials such as polyester, natural fiber, glass etc. in order to produce Technical Textile products indigenously.

Rakshit (2011) exhibited a paper on “Innovative Polyester fibers for future growth in Technical Textiles” in a world Textile conference. The aim of the presentation was to show the increasing importance of polyester in Technical Textiles. It was on the behalf of Reliance Industries limited to demonstrate the specialty of polyester staple fiber for Technical textiles which is produced by the industry under name ‘Recron’. Recron is an intrinsically flame retardant fiber/Tow which makes the fabric permanently flame retardant and finds major application in Hometech. The presentation also shows the new generation synthetic fiber and innovations in Polyester. It is concluded that Reliance has taken huge steps to develop the new product range in Recron polyester connecting with R&D which meets global standards and suitable for different Technical Textile segments.

Bonn (2011) wrote a trend book entitled “Technical Textiles 2011” which tries to analyze the world market trends and forecasts of Technical Textiles and Non-woven focusing on medtech, smartech, Buildtech, hometech, fibres and technology. It put special emphasis on Indian market for Technical textiles because after China, Indian textile industry is second largest industry in the world which is advancing fast in this sector. It is concluded that India is equipped with huge potential in the leading Asian markets and demand for technical textiles and nonwovens is also increasing in India. The Indian textile companies, for whom the area of technical textiles was only a side business until now, are more and more focusing on the products of this growth area.

Chaudhary and Shahid (2011) in their paper “Technical Textile industry in India: Special reference to Hometech industry” tried to disclose the present position of Technical textile industry in India. The main objective of the study is to draw the attention of both the government and private sector for the technical textile industry in India. The study focused on the Hometech sector because it is one of the largest segments of Indian technical textile industry. The paper concluded that in spite of various initiatives taken by the government to promote this sector still need is to more
efforts of the government of India that would make India a key player in the textile industry. It also suggested that the promotion of Hometech segment requires the setting up of centre of excellence for the hometech products and government should focus on this matter.

Chugan (2011) in the paper entitled “Diversification into Technical Textiles: A Forward Momentum for Indian Textile Industry” tried to explain the salient features of technical textiles in respect of opportunities for the Indian textile industry. The author considered termination of the WTO agreement on textiles and clothing in 2005 the turbulent time for the industry because with the removal of the quota regime, the industry started facing tough competition from other countries leading to slowdown in exports in subsequent years. Besides, the textiles and garments manufacturing industry were badly hit by Global Financial Crisis during 2008. Resultantly, at least 1.2 million workers in this industry were jobless by the end of March 2009. Moreover, the economic incentive package announced by the government in 2008 also failed to improve the industry, since it did not address all the major issues. The author states that in this scenario of downsizing exports, technical textiles are a vital area which has great potential for diversification and advancement of the industry because conventional textiles and clothing have reached at saturation stage in terms of product development, diversification, value addition, etc. and are subject to severe global competition. Technical textiles, on the other hand, offer great opportunities in different parts of the world as well as in the domestic market. The author concludes that diversification into technical textiles is essential for the industry’s survival and revival which can provide a forward momentum towards sustainable recovery, because this segment will be about US$ 15 billion in next two to three years and will account for about 10 per cent of global value. The author expects that the import of core technical textiles items will be reduced as well as exports will be increased significantly in future.

Chaudhary and Shahid (2012) in their paper entitled “Growing importance of Hometech Textiles in India” endeavored to show the Hometech Textiles as an essential segment of Technical Textiles Industry in India. The purpose of the study is to verify that the demand for Hometech textiles is large enough and is going up in India in the near future. It put special emphasis on market size, exports and imports of
Hometech products in order to show the magnitude of the industry in India and offers suitable suggestions for improving the growth and development of the sector.

Chaudhary and Shahid (2012) in their paper “Technical Textiles in India: The trade perspective” examined the India’s trade for Technical Textiles in the past decade i.e. from the year 2001-2002 to 2009-2010. The main purpose of the study is to investigate the trend during 2001-2010 and to project the export and import of India’s Technical Textiles from yr. 2010 to 2015. The results show the progress of both export and import of India’s Technical textiles over the last years but at the diminishing rates and exhibits the larger amount of export over the import, which leads to the conclusion that India’s Technical textiles trade is expected to be increased in future.

Gupta (2012) in the presentation on “Standardization of Technical Textiles- An Overview” states that the presence of developed countries in Technical Textiles is very significant but in case of developing countries like India, its production requires huge investment, technology know-how, better production facilities and standardization in order to take benefit of the new opportunity in this sector.

Bonn (2012) wrote another trend book entitled “Technical Textiles 2012/13” which covers significant segments such as Protech, Indutech, Agrotech and Mobiltech along with expert reports regarding the mega trends of urbanization and bionic. It also covers European market overview with detailed business data which is divided into the areas such as fibers, chemicals, textile auxiliaries, textile machinery and technical textile. It highlights the solutions and strategies for a “sustainable” future and also carries the Chinese market into the foreground. It is concluded that the market for technical textiles in China will increase in near future but it needs foreign investors who wants to realize investments in China because it is not possible for the Chinese textile industry to meet the increasing demand, especially for highly advanced and higher quality technical textile.

Ramkumar (2012) in the paper entitled “FDI for Technical Textiles” endeavored to reveal the opportunities for (FDI) Foreign Direct Investment in Technical Textiles sector. The paper reports that some groups are opposing the Government’s policy that the new FDI policy will fall down the small sized grocery and trading outlets with regard to general food and other products. But in the case of fast moving consumer technical textile goods such as diapers, this situation is entirely
different. Major brand items in this sector are imported from outside India except one or two indigenous manufacturers. Private label products are mostly imported from Taiwan, South Korea and China. The author expects that the multi-brand retail segment will take off in a big way; there will be great opportunities for improving trade and domestic manufacturing. With regard to FMCG items which are based on the governments' new FDI policy that some portion of the goods traded in retail outlets in India, (30% in one scenario) are produced domestically within India, there will be much scope for the domestic producing of diapers, wipes, feminine care products in India. Assuming that 70% of the remaining items that will take up the shelves of multi-brand outlets will be imported supplied it is cheap to do so; it will generate additional income streams for the government and small and medium sized traders. The author is of the opinion that government's duty structures and fiscal policy that supports the shift from import trade to domestic manufacturing of fast moving consumer products such as diapers, feminine care products, etc, will boost up the growth of the technical textiles industry.

Saha (2012) in the paper on “Technology Innovation in Home Textile Industry – The Way of Resurgence” shows the growing importance of Home textile industry in India with innovations and product diversification. The paper reports that with the increased exposure to the international scenario in the last two years, the domestic market has grown up in multifaceted. In addition, consumer's choice and desire has shifted from the traditional products to fashioned & trendy products. The study reveals that there is good demand for both branded and unbranded products, increasing purchasing power of consumers and low penetration level of unbranded products in urban and rural areas have attracted the international brand to the country and a few international brands have discovered Indian market especially tempting. Besides, liberal Foreign Trade Policy has encouraged foreign investment which resulted in increasing competition between multinational and domestic manufacturers. The move from the traditional product to the branded products in the domestic market has become more distinct in the recent past, with an easy availability of international branded products. The author concluded that there had been some innovations a couple of years back in home textile sector, though; the progress is very lethargic and tardy. Though, it is only in the last one decade, the industry has made serious efforts to produce innovative products by introducing state of art technology to enhance its
share in some segments in the global markets but this is not enough to face the emerging challenges. So it is suggested that the unorganized sectors should also follow the path of innovation. Government of India is also providing financial support to improve technology and capacity building. Thus, Indian home textile industry should take benefit of the opportunity to reap of such initiative.

Sharan (2013) in the paper entitled “Expanding Horizons of Textiles – A Versatile Product” tried to show an over view of the use of non apparel textiles. The paper exhibits that how the applications of textiles have crossed many obstacles beyond the regular use which man can never expected. The author is of the opinion that it is the functional character in producing the desired performance which has turned the textile materials to be in demanding place for out of home articles. There are several factors that support the augmented consumption of textiles in special applications. Over the past several decades, textile fibers have captured an inevitable place in composition and as an essential part of product structure. It is predicted that in future almost all textile products including what we wear and walk on seem destined to be transformed from their present to multifunctional, adaptive and responsive systems. The textiles can be classified into four categories, based on the performance and function which are; Apparel textiles, Home textiles, Interior textiles and Technical textiles. It is concluded that every new step is paving the way to further expansions. At the present time, these kinds of textiles are making a noteworthy contribution to the increasing market of textiles. Hence, with the succeeding steps and promising trends in the textile industry, greater attention will be drawn from every nook and corner of the world, which eventually get better the economic strategy of the world to a larger extent, proving that textiles are not only linked to the usual use of protection and safety but also to technological progresses satisfying the wants of mankind globally.

1.8 Research Gap

The above review exposes a wealth of knowledge and information in respect of the earlier studies based on market size, consumption, prospects and challenges of Technical Textiles in India and abroad. Majority of the study deals with its scope, significance, necessity, advantages, government initiatives and issues concerns for low growth of the industry, but lack concerns for its growth and development in India. No work used the time series data from 2002 to 2012 to analyze the actual position of
the industry in India. They have just taken into account the consumption and market size for the year 2007-2008 and made projections for the year 2012-13. They also do not measure the exports and imports of the industry in order to analyze its status in international trade. Some of them have devoted to show the importance and demand of various segments of the technical textile industry such as Geotech, Meditech, Buildtech, Agrotech but they did not even touch the Hometech segment.

The review of literature thus reveals a gap in so far as no study is specific in dealing with the Hometech segment of the Technical textiles in India. Nor does any work reviewed above tried to examine the financial performance of the Indian Hometech industry in general and selected companies in particular. The present study is an earnest attempt in the direction of bridging this gap. It is devoted entirely to the Hometech industry in India for measuring its growth and development from 2002 to 2012. Since the government of India realized the importance of this sector in the year 2002 and implemented various schemes for the promotion of technical textile industry, the period of ten year is divided into two blocks 2002-07 and 2007-12 (plan periods i.e. tenth and eleventh plan) and the performance of Hometech industry under both blocks has been explored on the basis of four parameters of the industry.

1.9 Objectives of the Study

The main objectives of the study are as under:-

1. To explore the overall Growth and Development of Hometech industry in India.

2. To identify the key dimensions of Growth and Development of Hometech industry in India.

3. To analyze the trends in the key dimensions i.e. Production, Export, Import and Financial Performance, during the last decade, of Hometech industry in India.

4. To suggest/propose strategies for Growth and Development of Hometech Industry in India.

1.10 Hypotheses of the study

The Hypotheses formed for the study are as follows:

1. **H_0 (Null Hypothesis):** There is no significant difference in the Production of Hometech industry in India during 2002-2012.
Hₐ (Alternate hypothesis): There is significant difference in the Production of Hometech industry in India during 2002-2012.

2. H₀ (Null Hypothesis): There is no significant difference in the Exports of Hometech industry in India during 2002-2012.

Hₐ (Alternate hypothesis): There is significant difference in the Exports of Hometech industry in India during 2002-2012.

3. H₀ (Null Hypothesis): There is no significant difference in the Imports of Hometech industry in India during 2002-2012.

Hₐ (Alternate hypothesis): There is significant difference in the Imports of Hometech industry in India during 2002-2012.


Hₐ (Alternate hypothesis): There is significant difference in the Financial Performance of Hometech industry in India during 2002-2012.

1.11 Research Methodology

Research Methodology is a mode of finding out the results of a specified problem on a given matter that is also called as research problem. In Methodology, researcher have to use different decisive factors as well as different sources that ultimately involves use of different type of methods for solving the given research problem. (Industrial Research Institute, 2010).

1.11.1 Sources of the Data

A quantitative, descriptive approach is adopted under study. The data and information collected during course of the study has been obtained from secondary and tertiary sources which are given as under:

- Ministry of Textiles, Udyog Bhawan, New Delhi.
- Textile Committee, Office of the Textile Commissioner, Mumbai.
- Federation of Indian Chambers of Commerce and Industry (FICCI), New Delhi.
- The Associated Chambers of Commerce and Industry of India (ASSOCHAM), New Delhi.
Annual Reports of the Selected Companies.

Journals.

Magazines.

Books.

Various Websites

All the data relating to selected companies under study have been obtained mainly from the prospectus, pamphlets, various websites and annual reports of the selected units.

1.11.2 Statistical Tools and Techniques

To prove the hypothesis and analyze the data collected from various sources, simple average mean, percentage, standard deviation, and Paired sample T-test has been applied in this study. The data has been analyzed with the help of Statistical Package for the Social Sciences (SPSS). The production, export, import and financial performance of the industry have been analyzed during Tenth and Eleventh five year plan period to see if there is any statistically significant change in growth and development of the Hometech industry, using “paired sample t-test” where:

\[ t_{\text{critical value}} = -2.776; \text{Alpha} = .05, \text{2 tailed test}; \text{d.f.} = N(\text{pairs})-1 = 5-1=4. \]

Simple Average Mean

“The mean of a distribution is commonly understood as the arithmetic average. It is perhaps the most familiar; most frequently used and well understood average. The mean of a set of observations or scores is obtained by dividing the sum of all the values by the total number of values” (Koul, 2012, p.317).

The Formula for finding the mean is:

\[ \bar{X} = \frac{\sum X}{n} \]

Where,  
M = mean  
\[ \sum \] = Sum of  
X = scores in a distribution  
n = total number of scores
Percentage Method

“Percent increase and percent decrease are measures of percent change, which is the extent to which something gains or losses value. Percent changes are useful to help people understand changes in a value over time” (Percent Increase and Decrease, n.d.). Percentages are based on descriptive relationship. The terms percentage change, percent (age) difference, or relative percentage difference are also commonly used because the comparison is expressed as percentages.

\[
Percentage\ Change = \frac{Old\ Value - New\ Value}{Old\ Value} \times 100
\]

Variance

“The average of the squared deviations of the measures or scores from their mean is known as the variance. The standard deviation is the positive square root of variance.” (Koul, 2012, p. 324).

The formula is

\[
Sample\ Variance = S^2 = \frac{\Sigma(X - \overline{X})^2}{n - 1}
\]

Standard Deviation

“The standard deviation is the most common measure of variability, measuring the spread of the data set and the relationship of the mean to the rest of the data. If the data points are close to the mean, then the standard deviation will be small. Conversely, if many data points are far from the mean, then the standard deviation will be large and if all the data values are equal, then the standard deviation will be zero. It is the square root of the variance.” (AGA Institute, n.d.) The standard deviation is calculated using the following formula.

\[
S^2 = \frac{\Sigma(X-M)^2}{n - 1}
\]

Where \(\Sigma\) = Sum of
X = Individual score
M = Mean of all scores
N = Sample size (number of scores)

**Paired Sample t Test**

The paired t test is also called as the correlated group t test. It is used when two samples and a within-groups design are studied and this design is known as dependent or repeated-groups design. This statistical test and its research design can vary between different statistical software packages and from book to book. A conceptual understanding about the test what is doing can clear out all confusions as well as necessary for its correct application (Sage Publication, n.d.). One of the following experimental design conditions should be met for the application of this statistical test:

1. There should be two measures on the same subjects (“before” and “after” measures are common), or
2. There should be two separate samples but the subjects in each are individually matched so that there are similar subjects in each group but it is not necessary of having same subjects in each group (Sage Publication, n.d.).

For the purpose of calculating paired t test statistic, “first difference score for each pair of scores in the two samples are calculated which will be compared to the mean difference score (mD) of the null hypothesis population. The mean difference score for the paired samples is a measure of any effect of the treatment. If treatment does not have an effect, then there will not be a difference between the two groups, and the mean difference score will be zero (or close to it). However, if the treatment does have an effect, it will increase or decrease the scores from the control condition and therefore produce a mean difference score greater or less than zero. Thus, calculate the sum of the difference scores (ΣD), the sum of the squared difference scores (ΣD²), and the mean difference score D δ .Microsoft Word - 1507.docxPage 32 of 32and the standard deviation of the difference scores (sD). These difference scores would contrast with a null hypothesis population mean of no difference between subjects (mD = 0), and we estimate the standard deviation of the population difference scores (sD) based on the sample difference scores”(Sage Publication, n.d., p. 148).

Then, the mean of the difference scores are compared with the standard error of the mean differences, where n in the paired t test formula refers to the number of
difference scores or the number of pairs of data points, not the total number of data points (Sage Publication, n.d.). The decision rule is stated as if the significance value (p-value) is less than .05 (alpha), there is a significant difference hence, the null hypothesis is rejected. If the significance value is greater than .05, there is no significant difference hence, the null hypothesis is retained.

**Paired \( t \) Test Formula**

\[
I_{\text{obtained}} = \frac{\bar{D} - \mu_D}{S_D} = \frac{\bar{D} - \mu_D}{\frac{S_D}{\sqrt{n}}} = \frac{\bar{D} - \mu_D}{\sqrt{\frac{S_D^2}{n(n-1)}}}
\]

Remember that under the null hypothesis, \( mD = 0 \), so the formula becomes

\[
I_{\text{obtained}} = \frac{\bar{D}}{S_D} = \frac{\bar{D}}{\frac{S_D}{\sqrt{n}}} = \frac{\bar{D}}{\sqrt{\frac{S_D^2}{n(n-1)}}}
\]

**1.11.3 Sample Design for Financial Analysis**

“Sampling is a method of selecting experimental units from a population so that we can make decision about the population. Sampling design is a design, or a working plan, that specifies the population frame, sample size, sample selection, and estimation method in detail.” (Business and Industry, n.d.) The study has been carried out on the macro-level as well as micro-level. The macro study analyzes the growth and development of Hometech Industry in India in general. The financial analysis of the Hometech companies has been carried out on the micro-level because it was not possible for the researcher to select all the companies as the sample for the study. In this study, researcher determines the sample size of six Hometech companies for financial analysis by following the technique of non-probability sampling. In non-probability sampling, “the units are selected at the discretion of the researcher. Such samples use human judgment in selecting units and have no theoretical basis for estimating population characteristics” (Koul, 2012, p. 206).

**Population:** "A population containing a finite number of individuals, members or units is called a finite population" (Koul, 2012, p. 208). It is also called as Universe. The total number of Hometech companies is 60 out of which the sample of 6 companies has been taken into account for the financial analysis because they are
contributing 63.46% of the total production of Hometech industry in India. Therefore, the total performance measured through sample units is assumed to be representing the financial performance of the total Hometech industry.

The sample has been selected considering following factors:

1. The companies for which the data is available for the period of study i.e 2002-12).

2. The companies, which are engaged in production of Hometech products.

3. The companies, which are contributing 63.40 per cent of the total production of Hometech industry in India.

4. The companies, which are listed in stock exchange of India.

**Sample Size:** The sample size has 6 Hometech companies for the study which are given as follows:

1. Ginni Filaments Limited
2. Hanung Toys & Textiles Limited
3. Uniproducts (India) Limited
4. Reliance Industries Limited
5. Premier Polyfilm Limited
6. Arora Fibres Limited

**1.12 Period of the Study**

The study covers the period of 10 years i.e. from 2002-03 to 2011-12 to study the growth of the industry.

**1.13 Presentation Instruments**

The data collected would be analyzed and presented using tables, pie charts, line charts, graphs and bar diagrams etc.

**1.14 Scope of the Study**

The research work shall certainly throw light upon certain aspects where the government of India needs to work out. The study covers the period of ten years that would reveals whether the contribution of the government for the promotion of Hometech Industry is effective enough or needs more efforts in order to meet the domestic demand. The study is mainly extended to measure growth of the industry.
whether it is significantly improved or not during the selected decade. The macro-level study is undertaken into study which covers three parameters for the analysis i.e. production, exports and imports. The study is also extended to cover the micro-level research which examines the financial performance of some selected Hometech companies individually as well as collectively through ratio analysis and covers the four types of ratios into study i.e. profitability, liquidity, solvency and turnover. The conclusion and findings of the study would be of great help in understanding the various issues which are hurdles in the growth of the industry. The researcher would also offer some suitable suggestions that would be of great guidance in promoting the growth of the Hometech industry.

1.15 Limitations of the Study

The following are some main limitations of the study:

1. This study is mainly based on secondary data derived from the published reports of the Technical Textiles committee in general and annual reports of the industry in particular. The reliability and the findings are contingent upon the data published in the reports.

2. The biggest limitation of the study has been the non-availability of time-series data on production of Hometech industry in India for the years 2008-09, 2009-10 and 2010-11 which have been calculated by using interpolation.

3. There is poor maintenance of data and information by the Ministry of Textiles.

4. The study is limited to ten years.

5. Only certain parameters are considered in this study to measure the growth of the industry because of non-availability of data.

6. The micro study is based on ratio analysis which has its own limitations. As we know that ratio analysis has, like all other methods, limited value and application, it cannot reveal exact picture of the financial performance and its conclusions are not always reliable.

7. Finally, due to constraints of time and other limitations a sample of only six companies has been selected for financial analysis of entire Hometech industry of India which might not be the true representation of the population. This is a major limitation of the research project.
1.16 Scheme of the Chapters

The present study is divided into six Chapters as shown below:

**Figure 1.1: Scheme of the Chapters**

As shown in Figure 1.1, the first chapter is introductory in nature: it gives a synoptical view of the entire research work. It deals with the introduction, statement of problem, reviews related to the topic. The chapter also explains the objectives, scope, period, sample design and data collection used in the study. It gives details regarding the hypothesis framed; tools used for analyzing the data and find the conclusions. Finally the chapter also includes the limitations and chapter scheme of the study.
The Second Chapter studies the global as well as Indian overview of the Technical Textiles. Briefing the historical background of the industry the chapter includes present position, production, export, import and testing facilities for the Technical Textiles available in India.

The Third chapter explores the overview of Hometech Textile industry in India. Depicting the description of Hometech products, the chapter includes application of Hometech textiles, raw materials and technologies used for the Hometech products, global scenario, production and trade for Hometech textiles in India and challenges faced by the Indian Hometech industry.

In fourth chapter, the analysis of growth and development of Hometech industry have been explained in terms of first three parameters i.e. production, export and import. For analysis and interpretation, the period of ten year is considered and Paired sample T- test is applied in order to compare the growth of Hometech industry during the period.

The fifth chapter is divided into two parts i.e. Chapter 5 (A) and Chapter 5 (B). This chapter studies the fourth parameter of the research. A brief profile of selected units has been discussed in fifth chapter (A). It examines the trend in financials of the companies during the ten years and depicts the financial position of the Hometech Industry in India by collective data of the six selected companies.

The fifth chapter (B) deals with the analysis of profitability, liquidity, solvency and turnover of selected units under study. For analysis and interpretation of data the accounting tools like net profit ratio, return on net worth ratio, return on net capital employed, current ratio, debt-equity ratio, funded debt to total capitalization ratio, capital gearing ratio and activity ratio have been used by the researcher. The paired sample T-test has been applied to test the various ratios of the companies.

The last and sixth chapter gives the chapter-wise 'Summary, Findings, Problems and Suggestions'. The problems and findings of the present study are drawn out of analysis and in the light of findings; suggestions are offered to promote the growth and development of Hometech Industry in India and also to improve the financial position of selected units.
1.17 Conclusion

In the present chapter, the statement of the problem and review of literature have been carved out. On the basis of reviewed previous studies, the research gap has been traced by the researcher. Furthermore, the scope, objectives and research methodology of the study has been discussed at length along with the description of various hypotheses that are undertaken. The statistical tools and techniques, presentation instruments, period of the study, samples, sources of the data and limitation of the study have been discussed in detail. After having discussed the research design and methodology the next chapter deals with the study of Indian Technical Textile Industry. It further shows the present position of the Technical Textiles in India.
1.20 References


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