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Sustainable Textiles for Sustainable Development

Market Research Study- India

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We hope that this study is useful for both practitioners and advocacy groups alike to further the cause of eco-friendliness. Any omissions or errors are ours.

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EXECUTIVE SUMMARY

The Indian textile and clothing industry plays a dominant role in the national economy and has a prominent position in the global textile industry. Its total market size is estimated at US$ 52 billion, 4% of the global trade in textile and clothing products. India ranks seventh in the global trade in textiles and it is fifth in the total global trade in clothing. India is also the fourth largest producer of staple fibre and is sixth among filament yarn producers. The textile and clothing industry alone contributes 20% to India's industrial production, 4% to the national GDP and 15% to India's gross export earnings. Yet, research and policy attention have not focused on environmental challenges posed by the sector and the 11th five year plan for the textiles sector does not even list managing environmental impact as one of its priorities.

The textile industry is one of the most chemically intensive industries globally, and the biggest water polluter after agriculture. It takes about 500 gallons of water to produce enough fabric to cover one sofa. Many countries have adopted environmental standards and requirements restricting the use of harmful chemicals in the production of textile and clothing – these are mandatory and imposed by various laws and regulations. In India, the regulatory framework for environmental standards for textile manufacturing units has been in place for many years. But compliance by the Indian textile industry (especially processing units) has overall been rather poor. This is primarily because the costs have gone up but price realisation has not kept pace, making investing in greener technology and processes unviable, especially for producer groups and manufacturers whose operations are either small or medium scale (such as handloom producers) or cater to the domestic market where eco-requirements are not yet particularly stringent.

This study conducted domestic market research to help lay the groundwork for formulating effective marketing strategies for eco-friendly products in the domestic market. Through extensive primary and secondary research, including visits to retailers, consumer surveys and interviews with producers of eco-friendly products, the study collected information on the nascent eco-friendly product market in India including the size of the market, structure, future trends, potential niches, current price information, information on buyers and useful market contacts.

An increase in consumer awareness has led to the emergence of 'green' market segments in many markets across the world. Manufacturers responded to this market and the explosion of advertisements and product labels using the environment to sell products that followed soon left consumers bewildered and confused. A 1996 study by Consumers International found many instances of misleading environmental claims in Central and Eastern Europe. A study by three United States universities found that terms such as "environment-friendly' were being used thrice more often in 1995 than 1992. As a result, third-party certification in the form of eco-labels was born as a means of providing environmentally conscious consumers with reliable information regarding the environmental impact of the products they are purchasing.

Eco-labels have been far more successful than regulations and laws in effecting environmental and health protection as well as pollution control. Most eco-labels have stringent criteria, thereby impelling manufacturers to design and develop environmentally friendly products and to reduce their carbon footprint. The Indian government launched a voluntary eco-labelling scheme named "Eco Mark" in February 1991 with the earthen pot or

The textile industry is one of the most chemically intensive industries globally, and the biggest water polluter after agriculture

matka as the symbol. In spite of being in existence for 16 years, the Indian eco-label has not really caught on with buyers. Currently, only 12 manufacturers in India have been awarded the Eco Mark for products such as paper, paper pulp and paper board. However, not a single product carries the mark.

The Indian eco-friendly textiles market is at a nascent stage. There is an absence of any significant player selling products with eco-friendly tags. Unlike in the West, there is not a single functional eco-label operating in the domestic textile market. Instead, producer groups stake their own claims or brand associations to eco-friendliness, capitalising not on absolutist criteria of what constitutes eco-friendly but on consumer perceptions of eco-friendliness. These perceptions are based mainly around four areas: 1. Fibre related marketing tags: Organic, (khadi) made from natural fibre, chemical-free, ahimsa textile; 2. Process related marketing tags: Uses natural dyes, ozone-friendly, Azo free dyes hand block printed, hand-woven, handmade, recycled, or bio-degradable; 3. Social factor related tags: Made by tribal communities, craftspeople, other disadvantaged segments; and 4. Ethics related tags: Moral fibre/clothing with a conscience. There are different connotations to the word "eco-friendly" and in the absence of any label or standardized process, there are multiple products in this segment which are being pitched and sold as eco-friendly products by multiple players wherein the entire responsibility is on the consumer to decide whether the product is actually eco-friendly or not.

The Indian eco-friendly textiles market is at a nascent stage.

Unlike in the West, there is not a single functional eco-label operating in the domestic textile market.

Interviews with manufacturing units, retailers and consumer surveys showed that there was an increasing awareness and buying interest for eco-friendly products amongst the middle-class, especially young working professionals and women. However, the majority of respondents are wary of paying a premium even when they received watertight assurances about the eco-friendliness of a product. This points to the need for more brand-promotion overall for eco-friendly products. Non-availability and high prices are two of the most frequently cited reasons among consumers for not buying eco-friendly products.

The growth of organized retail in India and increasing consumer awareness provides an opportunity to carve out increasing market-space for eco-friendly textiles and crafts in the Indian market and use that as a stepping stone for global competitiveness in eco-friendly market segments. The main areas that we need to work on are brand building – in terms of building a credible Indian eco-label and raising consumer awareness; encouraging additional entrepreneurs in the textiles sector to take up eco-friendly manufacturing processes so as to provide consumers with a wide range of product choices; and developing more efficient distribution chains so as to make eco-friendly products competiteve in the market.

1. ABOUT THE STUDY

1.1 Context [1]

The All India Artisans and Craftworkers Welfare Association (AIACA), a not-for-profit organization working for the crafts sector in India, is executing the research and policy education components of the Switch Asia Project. Sponsored by the European Union, the project is being implemented in partnership with Traidcraft, United Kingdom (UK) and Jaipur Integrated Texcraft Park Private Ltd (JITPPL). Implemented over four years, the project seeks to promote sustainable production and consumption practices in the textile and craft sector in India.

The project's objective is to promote the production (i.e. development of less polluting and more resource efficient products, processes and services) and consumption of environment-friendly textiles to reduce poverty and improve the quality of life for artisans in the textile and craft sectors. This will be achieved by conducting action research and pilot interventions to set new sector-wide best practice standards for environmental compliance and improvements in the health and safety measures provided for craftspeople and textile workers.

Specifically, the project will pilot effluent treatment facilities and training of workers, and targets 25,000 artisans in 500 block-printing small and medium enterprises (SMEs) in Rajasthan. Fourteen other textile clusters and thirty Government of India (GoI) approved Textile Parks will also benefit from research on low-cost technology, sharing of learning and opportunities for replication.

The SWITCH-Asia project will establish a model eco-friendly textile park that would set an example for the other 29 approved textile parks across India. The project seeks to bring together a range of partners- including technical service providers, textile producer groups, SMEs and local government representatives- to conduct action research, which will provide low-cost technological solutions to reducing pollution from craft and textile production activities. The project is relevant to the needs of textile-producing SMEs (particularly the block-printing industry), the key target group, as they will benefit from a better brand image in the market because of adopting more eco-friendly and socially responsible practices.

The current assignment of domestic market research aims to provide inputs to stakeholders that would help them identify the market for the sustainable eco-friendly textile products and accordingly design and produce products appropriate to these market segments and tastes.

1.2 Objectives

The specific objectives of the market research are to:

- Conduct domestic market research to identify and assess the demand for sustainable eco-friendly textile products in India which includes:
    - Market trend analysis (for the last 3-5 years) of eco-friendly products in India
    - Information collection on the domestic market including the size, structure, future trends, potential niches, current price information, information on buyers and useful market contacts

The project's objective is to promote the production (i.e. development of less polluting and more resource efficient products, processes and services) and consumption of environment-friendly textiles to reduce poverty and improve the quality of life for artisans in the textile and craft sectors.

[1] "SWITCH-Asia Promoting Sustainable Consumption and Production - Project Brief." April 2009. All India Artisans and Craftworkers Welfare Association. 2009 <http://www.aiacaonline.org/pdf/switchasia.pdf>.

  - Analysis of the supply chain/market channels to identify potential points of entry, opportunities and challenges for eco-friendly products

- Assist in formulating effective marketing strategies for eco-friendly products targeting the domestic consumer

As there is an international market research study being conducted, the domestic research team will coordinate with the International Market Research Consultant to ensure a synergy between the two studies.

The recommendations of the research will be presented to the JITPPL and designers who are part of the Switch Asia project to guide the development of a range of eco-friendly products according to the current demands and trends in the market. This will also assist the JITPPL in developing a marketing strategy in collaboration with various SMEs and partners.

1.3 Methodology

The research methodology comprised of both primary and secondary research:

- **Primary research** included market visits in four metros of the country and meeting key actors in eco-friendly product value chains. Forty organisations (listed in Annexure 1) were covered in the research. Sectoral experts were also consulted to gain a technical as well as market perspective.

  Given that the number of such retail and producer organisations is limited, interactions and visits were also made to stores who sell handloom/artisanal/ natural items to derive a wider understanding of this 'off-mainstream' market. The study also included a consumer survey in two forms, online and at a FabIndia store in Delhi. This ensured direct consumers' perspective to the study.

- **Secondary research** focused on issues related to market, production points and technical aspects. One of the focus areas of the secondary research was defining the universe, eco-system and understanding of eco-friendly and sustainable textiles. The research also looked into the labelling aspects of eco-friendly textiles and their status at the national as well as at the international level.

  The secondary research also focused on the role of the textile industry in India, the current and potential market of the different sectors in the textile industry and finally the issues related to eco-friendly products, i.e. understanding in Indian context, eco-friendly fashion, and recent buzz or the news related to the eco-friendly textile market. In addition, the research tried to gather information on the production points.

Respondent Categorisation

The primary research categorized its respondents into the following categories:

- Retailers
- Consumers
- Producers
- Suppliers
- Support Institutions
- Sectoral Experts

Sampling and Data Collection for Primary Research

Primary data collection in four cities: Primary market visits and discussion with key actors were undertaken in Delhi, Bengaluru, Kolkota and Mumbai. Preliminary information regarding the different actors were collected through web-searches, list of AIACA member

organizations provided by AIACA, information from the designer or the textile industry and finally from the market itself during the visits.

A data collection toolkit was designed which included interview schedules for Retailers, Producers/Suppliers and Support organizations (which includes policy and industry organizations). The interview schedules are given in Annexure 2, 3 and 4.

- **Online consumer survey:** A website-based online consumer survey was designed and conducted. A total of 175 consumers took the survey.
- **Consumer survey at Vasant Kunj, FabIndia:** During the project, it was felt that it would be interesting to conduct a survey amongst the consumers of FabIndia products. The research team felt that the FabIndia consumer would be representative of consumers interested in purchasing eco-friendly products. Sixty responses were collected from the Vasant Kunj, Delhi store of FabIndia. The form used was same as the online survey and provided an interesting comparative analysis. The survey form is given in Annex 5.
- **Stakeholder consultation:** A half-day consultation was organized by the Research Team to share their findings and preliminary analysis with AIACA and other industry experts. This consultation was organized at India International Centre, New Delhi on 22 September 2009. This consultation gave valuable inputs to the study and helped in maintaining the right focus.
- **Meetings with experts:** The Research Team also met prominent figures from the crafts and textile sectors who are known for their efforts to promote artisans and their products during their field research in various cities. This helped in understanding production and marketing related issues from the artisan and support organization perspective.
- **AIACA member survey:** The team attempted a survey via email and website for AIACA and Craftmark members. However, this method got very limited response and only three AIACA members responded to the survey.

Product Categorisation

In order to identify and assess the market situation, the research team created an exhaustive product range listing which can be broadly categorized into three categories:

- Furnishing
- Garments
- Accessories

The following is the listing of the same:

Table 1: List of Products Examined during the Study

Furnishing	Garments	Accessories
Soft furnishings • Sofa throws • Floor cushions and pillows • Cushions • Pillows Table linen • Napkins • Placemats • Runners • Table covers Bed linen • Bedding for infants • Bedding for toddlers • Bedding for children • Coversheets • Quilts Bath towels Floor mats Flooring rugs Car seat covers Upholstery Curtains Curtain accessories	Men's wear Women's wear • Maternity clothing Children's wear • Infant clothing • Toddler clothing Woollens • Sweaters Casual wear Formal clothing Sportswear • Fitness clothing • Swim suite Undergarments Bathrobes Sleepwear Socks and stockings Special purpose clothing • Party wear • Stage wear • Uniforms and work wear • Wedding garments • Evening wear	Bags • Cotton bags • Jute bags • Tote bags • Woollen bags • Beach bags • Laptop bags • Quilted bags and luggage • Straw and rope bags • School bags • Children's bags • Toddler's bags Belts Stoles Scarves Shawls Handkerchiefs

2. TEXTILE AND CLOTHING INDUSTRY: AN OVERVIEW[2]

The Indian textile and clothing industry (plays a dominant role in the national economy and has a prominent position in the global textile industry. Some of the key facts about the industry are:

- Its total market size is estimated at US$ 52 billion, 4% of the global trade in textile and clothing products.
- India ranks seventh in the global trade in textiles and it is fifth in the total global trade in clothing. India is also in the remarkable position of being the fourth largest producer of staple fibre and is sixth among filament yarn producers. India also accounts for one fourth of global trade in cotton yarn.
- The textile and clothing industry contributes 20% to India's industrial production, 4% to the national GDP and 15% to India's gross export earnings.
- India has the second largest installed base of spindles with 30 million operational spindles, the second largest producer of cotton (31.5 million bales are produced annually, supports agriculture in over 9.5 million hectares of land where cotton is cultivated), and the fourth largest producer of Man Made Fibres (2.51 million tonnes) in the world.[3]
- The textile and clothing industry also provides direct employment to 35 million people and an additional 47 million people in allied sectors (next only to agriculture).

The primary sectors of the textile and clothing industry include:

- Man-made fibre industry
- Decentralised power mill textile industry
- Filament yarn power loom sector
- Woollen textile industry
- Silk industry
- Jute industry
- Handloom industry
- Clothing and apparel

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[2] The Report of the Working Group (WG) on Textiles and Jute Industry for the Eleventh Five-Year Plan (2007-2012). New Delhi: Government of India, Ministry of Textiles, 2007.

[3] Mangalam, Shaju. "Eco-labelling Challenges and Opportunities for Indian Textile Industry." Presentation at National Eco-labelling Workshop, Jaipur, India- 23 June 2008 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=7741FDDA-1983-4E8E-9DD2-06E7ED9806CD>.

2.1 SWOT Analysis of the Indian Textile and Clothing Industry

Table 2: SWOT Analysis of the Indian Textile and Clothing Industry

Strengths	Weaknesses
• Strong and diverse raw material base • Third largest producer of cotton • Fifth largest producer of man-made fibre and yarn • Vertical and horizontal integrated textile value chain • Strong presence in entire textile value chain from raw material to finished goods • Globally competitive spinning industry • Average cotton yarn spinning cost at US$ 2.50 per kg. Which is lower than all the countries including China • Low wages: rate at US$ 0.75 per operator hour as compared to US$ 1.00 in China and US$ 3.00 in Turkey • Unique strength in traditional handlooms and handicrafts • Flexible production system • Diverse design base	• Structural weaknesses in weaving and processing • 2% of shuttle-less looms as percentage of total looms as against world average of 16% and China at 15%, Pakistan at 9% and Indonesia with 10% • Highly fragmented and technology backward textile processing sector • Highly fragmented garment industry • Except spinning, all other segments are predominantly in decentralized sector • The rigid labour laws: proving a bottleneck particularly to the garment sector • Large seasonal orders cannot be taken because the labour strength cannot be reduced during the slack season • Inadequate capacity of the domestic textile machinery manufacturing sector • Big demand and supply gap in the training facilities in textile sector • Infrastructural bottlenecks in terms of power, utility, road transport etc.
Opportunities	**Threats**
• Quota phase out - pushing the export growth to the level of 22% in 2005-06 • Buoyant domestic economy • Increasing disposable income levels • Increasing working female population: The propensity to spend in the case of working women is higher by 1.3 times as compared to a housewife • Increased use of credit cards and availability of cheap financing would also provide a boost to impulsive apparel purchases • Revolution in organized retailing would increase the consumption of apparel and ready mades	• Possibility of a global recession triggered by a weakening dollar • Higher competition especially after 2008 when China cannot be restrained under World Trade Organization (WTO) rules • Non-availability of indigenous textile machinery • Lack of domestic capital and absence of appetite of domestic industries to invest in the quantities envisaged for 12% growth target

Keeping these features of the textile industry in mind, the Government of India in its Eleventh Five-Year Plan (2006-07 to 2011-12) has laid down the following objectives and growth targets for the sector:

Objectives

- Build world-class state-of-the-art manufacturing capacities to attain and sustain predominant global standing in manufacture and export of textiles and clothing.

- Facilitate growth of the Indian textile industry at the rate of 16% in value terms to reach level of US$ 115 billion (comprising of US$ 55 billion of exports and US$ 60 billion of domestic market).
- Attain a 7% share in global textile trade by 2012.

Targets

- Cloth production expected to grow at the rate of 12% in volume terms
- Clothing and apparel expected to grow at the rate of 16% in volume terms and 21% in value terms
- Exports expected to grow at the rate of 22% in value terms

2.2 Raw Material Production

Cotton production witnessed a significant growth rate of 14.5% in 2004-05, and 15.13% in 2005-06. Continuing with this trend, it is projected that it will increase at the rate of 14% until 2012. The production of blended cloth did not grow during the first four years of the Tenth Five-Year Plan, except during 2005-06 at a rate of 3.48%. It is estimated to increase now at 7% due to the removal of anomalies in excise duties.

The production of 100% non-cotton cloth showed an increase of 12.7% in 2001-02, and 9.16% in 2003-04, though the same growth was not maintained in the later years of the Tenth Five-Year Plan. Considering this as a temporary phenomenon and after the removal of anomalies in excise duties and the consequent spurt in production, it is projected to grow at a rate of 10% during the Eleventh Five-Year Plan period.

Cloth production expected to grow at the rate of 12% in volume terms

Clothing and apparel expected to grow at the rate of 16% in volume terms and 21% in value terms

Exports expected to grow at the rate of 22% in value terms

Table 3: Projection of Sector-Wise Share in Cloth Production[4]

Sector	Percentage Share in Production	
	Actual 2005-06	Projected 2011-12
Mill sector	3	5
Power loom sector	62	61
Handloom sector	13	13
Hosiery sector	21	20
Khadi/Wool and Silk sector	1	1
Total	**100**	**100**

2.3 Sectoral Composition of Textile Industry

The textile industry is comprised largely of different sectors. A brief profile on the six major sectors in the textile industry (a. power-loom, b. handloom, c. clothing and apparel, d. wool, e. jute and f. technical textiles) is presented below:

Power-loom Sector

- Most important sector in terms of employment generation, 48.60 lakh people employed in this sector and fabric production accounts for 62% of the total cloth production in the country
- As of 31 March 2006, there were approximately 4.30 lakh power loom units with 19.44 lakh power-looms in the country
- The technology level of this sector varies from plain looms to high-tech shuttle-less looms
- According to the census of power processing united conducted by the

[4] The Report of the Working Group (WG) on Textiles and Jute Industry for the Eleventh Five-Year Plan (2007-2012). New Delhi: Government of India, Ministry of Textiles, 2007.

It is the second highest employment generating sector in India, employing 65 lakh persons, either directly and indirectly and is it is the largest handloom industry in the world

It contributes about 15% to cloth production, and in 2002-03 contributed over US$ 544 million in export earnings

Textiles Committee in 2005, there were 2,510 power processing units in the country as compared to 2,324 units found in 1999-2000

- The major clusters of textile processing units are in Mumbai, Surat, Ahmedabad, Delhi, Ludhiana, Amritsar and Tirupur

Handloom Sector

- It is the second highest employment generating sector in India, employing 65 lakh persons, either directly and indirectly and is it is the largest handloom industry in the world
- It contributes about 15% to cloth production, and in 2002-03 contributed over US$ 544 million in export earnings
- It grew at a rate of 25.63% over the previous year

There are also various challenges that exist in the handloom sector, including

- It is a scattered (there are more than 400 handloom clusters in India) and un-organized sector
- It faces unrestricted competition from the domestic power-loom/mill-made fabric and from cheap imported mill cloth
- The high cost of credit, low disbursement of credit, reduction in the marketing incentive on a tapering basis and the withdrawal of duty exemption make it hard to sustain

Table 4: Fibre-Wise Projection of Cloth Production (million square meter)[5]

Type of cloth	Estimated Production (2006-07)	Projected Production (2011-12)
Cotton	25,207	49,629
Blended	6,866	9,630
100% Non-cotton	21,487	34,605
Khadi, Woollen and Silk	700	736
Total	54,260	94,600

Clothing and Apparel Sector

This is an important sector in terms of employment generation, especially for women (they account for 38% of the workers in the clothing sector) and export, contributing about 49% to total textile exports.

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Clothing

- It is a fragmented sector, composed predominantly of small-scale enterprise - the reason could be attributed to the Small Scale Industries (SSI) reservation policy
- In 2005-06, total production was 7.85 billion pieces with a value of Rs. 93,328 crore
    - In exports - 2.24 billion pieces with value of Rs. 37,208 crore
    - In the domestic market - 5.61 billion pieces with value of Rs. 56,120 crore

Apparel

- It is concentrated primarily in eight clusters: Tirupur, Ludhiana, Bangalore, Delhi/Noida/Gurgaon, Mumbai, Kolkata, Jaipur and Indore
    - Tirupur, Ludhiana and Kolkata are major centres for knitwear
    - Bangalore, Delhi/Noida/Gurgaon, Mumbai, Jaipur and Indore are major centres for woven garments

[5] The Report of the Working Group (WG) on Textiles and Jute Industry for the Eleventh Five-Year Plan (2007-2012). New Delhi: Government of India, Ministry of Textiles, 2007.

- The unit value realization in the woven garment sector is about US$ 5.05 per piece and US$ 2.70 per piece in knitwear sector.

Woollen Textile Sector

- India is the seventh largest producer of raw wool accounting for 1.8% of the world production.
- It has about 4.2% of the total sheep population (in 2003, 6.15 crore)
- The wool industry is broadly divided between the organized and decentralized sectors – the organized industry includes:
    - Composite Mills
    - Combing Units
    - Worsted and Non-Worsted Spinning Units
    - Knitwear and Woven Garment units
    - Machine Made Carpet Manufacturing Units. Decentralized Industry- (i) Hosiery and Knitting (ii) Power loom (iii) Hand Knotted Carpets, Drugget, Namdahs and (iv) Independent Dyeing and Processing Houses.
- It is a key sector in terms of employment, in aggregate it employs 27 lakh people
- The major wool producing states in the country are: Rajasthan (44%), Jammu and Kashmir (J&K) (13%), Karnataka (12%) and Gujarat, Uttar Pradesh, Andhra Pradesh, Haryana (2%).
- There are 718 woollen units in the organized sector and a large number of units in the small scale sector - Ludhiana alone accounts for 225-240 units in the decentralized hosiery and shawl sector

Jute Sector

- This is a key industry in the eastern part of the country, particularly in West Bengal
- It is a major source of employment, supporting nearly 4 million farm families, directly employing about 2.6 lakh industrial workers, and providing a livelihood to an estimated 1.4 lakh people in tertiary sectors and allied activities
- Capacity utilization in the industry is around 75%
- According to the Report of the Expert Committee on Technical Textiles (July 2004), as of 2004, as a fibre jute contributed 14% of the total fibre consumption of technical textiles and in 2000, of the total consumption of 1,400 million sq. metres in geo-textiles jute constituted 1%
- Two growth areas for the jute industry, are technical textiles, including jute geo-textiles and jute-diversified products
- The industry is faces immense competition from the synthetic textile sector
- The fibre quality of jute needs to be improved, currently only about 11% of raw jute belongs to the high quality grades

Technical Textiles Sector

- Represents a multi-disciplinary field with numerous end-use applications
- In industrialized countries, technical textiles are a major activity, while in India it makes up less than 10% of the total textile industry
- The global market size of technical textiles was estimated by David Rigby Associates (an international consulting firm specialising in technical textiles) to have a volume of 19.68 million tones, valued in 2005 at US$ 106.90 billion - it is expected to increase to 22.77 million tones by 2010, with a value of US$ 127 billion

There are 718 woollen units in the organized sector and a large number of units in the small scale sector - Ludhiana alone accounts for 225-240 units in the decentralized hosiery and shawl sector

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3. ECO-FRIENDLINESS IN TEXTILES

3.1 The Textile Industry and Environmental Pollution

The initial environmental debate, in the 1970s and 1980s, placed rapid industrialisation and urbanization, coupled with an ever-increasing population, at its forefront. Early initiatives in the realm of environmental policy and regulation as well as eco-friendly business practice therefore focussed on large-scale mechanised production processes such as energy supply and issues such as air and water pollution.

In the 1980s, a more holistic view arose, encompassing the products and their environmental impact over their entire life cycle, i.e. raw material extraction, manufacture, use and final disposal.

Environmental Hazards of the Textile Industry[6]

The textile industry has been condemned as being one of the world's worst offenders in terms of pollution because it requires a great amount of two components: chemicals and water.

- **Chemicals**

As many as 2,000 different chemicals are used in the textile industry, from dyes to transfer agents. Traditionally produced fabrics contain residuals of chemicals used during their manufacture—chemicals that evaporate into the air we breathe or are absorbed through our skin.

Some of the chemicals are carcinogenic or may cause harm to children in pre-natal stages, while others may trigger allergic reactions in some people. According to a 2005 article in Business Week[7], "the population that is allergic to chemicals will grow to 60% by the year 2020."

- **Water**

A finite resource that is quickly becoming scarce, water is used at every step of the process both to convey the chemicals used during that step and to wash them out before beginning the next step. Water becomes full of chemical additives and is then expelled as wastewater; which in turn pollutes the environment:

- by the effluent's heat,
- by its increased pH,
- and because it is saturated with dyes, de-foamers, bleaches, detergents, optical brighteners, equalizers and many other chemicals used during the process.

The textile industry is one of the most chemically intensive industries on earth, and the biggest water polluter after agriculture. It takes about 500 gallons of water to produce enough fabric to cover one sofa

Global consumption of fresh water is doubling every 20 years. Mills discharge millions of gallons of effluent each year, full of chemicals such as formaldehyde (HCHO), chlorine, heavy metals (such as lead and mercury) and others, which are significant causes of environmental degradation and human illnesses. The mill effluent is also often of a high temperature and pH, both of which are extremely damaging.[8]

The textile industry has been condemned as being one of the world's worst offenders in terms of pollution because it requires a great amount of two components: chemicals and water.

[6] "Environmental Hazards of the Textile Industry: Environmental Update 24." Business Week 5 June 2005.
[7] "Environmental Hazards of the Textile Industry: Environmental Update 24." Business Week 5 June 2005.
[8] "Eco-Textiles." Intertek 2009 <http://www.intertek-labtest.com/brochures/Eco-Textiles>.

Polluting Processes in the Textile Industry[9]

- **Cultivation of Natural Fibres**

Cultivation often requires large amount of pesticides, fertilisers and water. In addition to its impact on the local water resources, excessive water utilisation may also impact the soil quality if too much is used in the irrigation of cotton, the salinity of the land may increase thereby adversely affecting the land's fertility.

Use of fertilisers and pesticides is also believed to have a negative effect on soil fertility. It may also have long-term effects on user health because of pesticide residue in textile products.

- **Spinning**

In the spinning process, individual fibres float in the air and thus pollute the atmosphere in the spinning department. Such floating fibres are dangerous to human beings who inhale it. To minimize the effect of these floating fibres or impurities, the humidified air, which is scattered in the spinning department, is filtered to remove these floating impurities from the air.

- **Sizing**

In the sizing function, starch is applied as a sticky paste on the yarn to enhance its strength and abrasion resistance. The starch paste consists of preservatives, which protect the yarn from being eaten by microorganisms. Some preservatives such as pentachlorophenol, which are obtained from phenolic and/or chlorinated compound, possess a toxic effect on human skin and ought to therefore be avoided. Utilizing a synthetic starch decreases the use of such preservatives, thereby decreasing the health hazards likely to occur because of phenolic and/or chlorinated preservatives.

- **Loom-shed**

There are two types of pollutants created by the loom shed, namely floating particles such as fibrous substances and size particles and noise pollutions. If proper steps are not taken during the weaving operations, oil stains are formed. Before chemical processing of textiles, these oil stains are removed. The application of carbon tetra chloride based products, as stain removers is a health hazard.

Textile Processing

These processes regarded as non-eco-friendly, use chemicals like potassium dichromate, sodium hypochlorite or peroxide and sodium hypochlorite in the preparation process of desizing[10], scouring and bleaching with their related wash-off stages, thereby producing heavy Biological Oxygen Demands (BOD) in the effluents. For decreasing BOD, it is recommended to choose the size recipes offering a low COD (Chemical Oxygen Demand) and BOD value. A change from pure starch to synthetic starch decreases BOD by approximately 90%.

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Chlorine, used in bleaching, creates halogenated organic substances, of which some are suspected to be carcinogenic, e.g., chloroform. Wool industry uses chlorine based compounds for anti-shrinking dealing, and such practice generates toxic effluent. For removing rust stains in bleaching, the cloth is treated with oxalic acid. The oxalic acid is lethal to aquatic organisms and it increases COD and BOD to a significant level.

Peroxide bleaching requires a stabilizer to ensure identical and monitored bleaching during the bleaching operation. Optional

[9] "Eco-Friendly Textiles." 23 November 2006. fibre2fashion. 2009 <http://www.articleonramp.com/Article.cfm?ID=449>.
[10] "Desizing." Wikipedia. 17 December 2009 <http://en.wikipedia.org/wiki/Desizing>.

German legislation of consumer goods state that, "No articles of dresses (textiles, shoes, leather) and bed linen can be put in trade, if they have been coloured with azo dyes that can release one of the twenty named amines".

stabilizers such as Aminio Tri Methylene Phosphoric Acid (ATMP), Hydroxy Ethyline Disphosphonic Acid (HEDA), Diethylene Triaminc Penta Methylene Phosphoric Acid (DTPMP) and Ethylene Diamine Tetra Methylene Phosphoric Acid (EDTMP) are also being suggested as peroxide stabilizers.

- **Dyeing**

German legislation of consumer goods state that, "No articles of dresses (textiles, shoes, leather) and bed linen can be put in trade, if they have been coloured with azo dyes that can release one of the twenty named amines".

Currently the list has been extended to 24 amines. The prohibition includes a variety of other commodity goods like leather components for furniture, seat covers, etc. The prohibited amines have been categorized as amines of the MAK Group-III A1 and III A2.[11]

MAK Group III A1 (workplace exposure): Carcinogenic amines: Benzidine, 4-chloro-o-toluidine, 2-naphtylamine and 4-aminodiphenyl

MAK Group III A2: These materials are tested only on animals and they have been proved carcinogenic. A variety of amines in these types are: a-toluidine, o-dianisidine, o-tolidine, o-aminoazotoluene, p-chroanneline, 3' dichlorobenzidine, 2-amino, 4-nitrotoluene and 2, 4-toluylene, diamine. This group also includes materials that may perhaps produce health hazards.

Some dyes form carcinogenic amines on reduction in dyeing, hence they require to be strictly evaded as per stipulation in a number of countries, considerably for increase of BOD/COD. Hence, these dyes need to be avoided for use in dyeing. Most of the known producers have stopped making and marketing dyes creating carcinogenic amines.

Regarding the direct, vat, sulphur and reactive dyes, dyeing processes need huge amount of salt to achieve good exhaustion of dye-bath. This leads to an increase in the dissolved salts in effluent water. Therefore, new dyes are being made, which would need less salt dilution for achieving dye fixation.

- **Printing**

As in the case of dyeing, printing, colours should be non-toxic and not based on forbidden amines. Dyes with high fixation properties and modified printing process requiring fewer washouts are recommended in printing. Use of kerosene in pigment printing has been significantly decreased, but it should be totally removed.

The use of urea has also been lessened by substituting it with other ingredients and modifying the printing methods. Citric acid in disperse prints should be substituted by optional chemicals. For nylon fabric printing phenol is utilized to a considerable extent, therefore it is suitable to replace it by diethylene glycol. Application of formaldehyde based on fixers for enhancing fastness of pigment prints should be limited to decrease free formaldehyde in final fabric.

- **Finishing**

Chemical formaldehyde based cross-linking agents applied to cellulosic textiles for crease resistance and dimensional stability are the most toxic chemicals. Free formaldehyde may be discharged from resin-finished fabrics either because of un-responded formaldehyde in the product

Chemical formaldehyde based cross-linking agents applied to cellulosic textiles for crease resistance and dimensional stability are the most toxic chemicals.

[11] MAK is a German term, which stands for *Maximale Arbeitsplatz-Konzentration*. MAK values pertain to exposure limits on various substances in different workplace atmospheres. The German listing of MAK Group-III A1 and A2 includes various carcinogenic materials, most notably amines, that have been banned.

in cross-linking or while storage of the finished fabrics. Many countries set various tolerance limits for free-formaldehyde according to the end use of the treated fabrics or garments. Presence of formaldehyde in the atmosphere and in wastewater is regarded as highly toxic and to overcome this trouble, formaldehyde scavengers (chemicals that neutralise toxic effects of formaldehyde) are to be used.

Among the various procedures, finishing presumes significant importance because the value addition is understood by functional finishing of cotton in fabric or garment form to reveal advantageous properties. Some of the most important finishes are easy care, durable press, wrinkle-free finishes, softening and enzyme/bio finishing.

3.2 What is an Eco-Friendly Textile?

Does "Eco-Friendly" Equal Cotton

Until the 1990s, many consumers and manufacturers believed that oil-based synthetic fibres such as polyester and nylon would cause the most harm to the environment and that cotton, a natural material, would obviously be an environment-friendly textile. Studies conducted in the early 90s proved otherwise.

According to the Sustainable Cotton Project[12], one third of a pound of pesticides and other agricultural chemicals are used to produce the cotton for one simple cotton T-shirt. Then ammonia, formaldehyde and other chemicals are used to process and finish it. Many of these chemicals are known or suspected carcinogens. According to the Pesticide Action Network, cotton accounts for 22% of all insecticides used - about US$2.5 billion worth worldwide each year.[13] Likewise, numerous studies and reports on air, water and soil pollution caused by the textile industry became widely available, earasing the popular perception of all natural fibres as organic.

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Consumer Perceptions

Today consumer perception equates ecologically friendly fabrics with organic materials that cause less harm to the environment – cotton and wool produced without synthetic chemicals or pesticides, or hardy, fast-growing plants like bamboo and hemp that are produced with relatively little pesticides or fertilizers.

Albeit less widely used but also counted in the current spectru-m of eco-friendly textiles are new materials that have been generated by fresh advances in the material sciences – biopolymers made from corn and soy, including a corn-based fibre called Ingeo by Cargill that is now being used by Versace and other designers, soy fibre, and lyocell (produce--d from wool-pulp cellulose).

Defining Eco-Friendly Textile

Although the toxic substances are widely known to be hazardous to the environment, their use has become intrinsic to industrialised and even, cottage industry based, textile production. Therefore, if the definition of an eco-friendly textile was to state that none of these hazardous substances must be present in the textile or used during its production, only 100% organic, hand-technique based, natural-dye-utilising textiles would qualify.

However, such an approach is utterly purist thereby automatically excluding the bulk of the textile industry and preventing achievable targets for the 'greening' of the textile industry as a whole.

The varying definitions of what specifically constitutes an eco-friendly textile are usually:

product based: limited to environmental impact of the product's use and its disposal, or/ and

process related: consideration of the entire life cycle of the product, thereby including raw material production, spinning, weaving, knitting, dyeing, printing, finishing, making up, packaging, distribution, use, disposal

[12] "About Us." Sustainable Cotton Project. 2010 <http://www.sustainablecotton.org/html/who_we_are.html>.
[13] Cortese, Amy. "Wearing Eco-Politics on Your Sleeve." Organic Consumers Association. 20 March 2005. Grist Magazine. 2009 <http://www.organicconsumers.org/clothes/ecofriend032205.cfm>.

Therefore, despite the lack of a single, globally standardised, definition of an eco-friendly textile, most countries and eco-labels cover a rather wide spectrum of natural and manmade textiles and textile processes, with varying ceilings on pollution levels and chemical content.

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Below is the criteria for determining eco-friendliness, which is stipulated at specific stages of textile production.

- **Textile fibre:** Limitation of toxic residue in fibre, reduction of air and water pollution during fibre process
- **Processes and chemicals:** Bans or limitations on formaldehyde, toxic pesticides, pentachlorophenol (PCP), heavy metal traces; bans on azo dyes which release carcinogenic amines, halogen carriers and chlorine bleaching; lower energy consumption = Lower carbon footprint
- **Product use:** Colour fastness during perspiration, washing, rubbing, drying, exposure to light. Limitation on dimensional changes during washing and drying and recyclable/ biodegradable

Additionally, in some definitions social aspects of production like "no child labour," "no sweatshops," "fair wages," "fair trade," and "safe working conditions" are also applied.

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When looking at variety of materials considered "environmentally-friendly," you need to look at them comprehensively. The first question is what is the renewability of the product. Renewable resources are items that can be replenished in a relatively short amount of time (as opposed to millennia).

The second factor to consider is the ecological footprint of the resource - how much land (usually measured in acres) it takes to bring one of the individuals (plants or animals) to full growth and support it.

Thirdly, it is important to consider in determining the eco-friendliness of a particular product is how many chemicals it requires to grow/process it to make it ready for market.

Eco-friendly Textiles.

HEMP

By far, hemp is the crop with the most potential as an eco-friendly textile. The ecological footprint of hemp is considerably smaller than that of most other plants considered for their fibres. Hemp plants grow very quickly and densely which makes it difficult for weeds to take hold, eliminating the need for herbicides and chemical fertilizers. It requires no irrigation as it thrives on the amount of water in the average rainfall, and it is highly pest-resistant.

Hemp has naturally long fibres which makes it suitable for spinning with a minimum of processing. Those fibres are also long-lasting; historically hemp has been used for making naval ropes that were used in and around water because they resist rot. If it held up to those conditions, imagine how well it will wear as a pair of jeans, or a shirt.

WOOL

Wool is produced by caring farmers can be a wonderful resource, with a few caveats. Sheep graze plants almost to

the dirt, and there is the issue of the manure entering into the water supply. Factory-farmed sheep (as with any factory-farmed animals) live miserable lives where the handlers are concerned with productivity and speed. Then there is the matter of bleaching the wool to get it white, or dyeing it, but with a responsible eco-friendly manufacturer most of these issues can be overcome.

ORGANIC COTTON

It is much more environmentally friendly than the traditional variety as it uses no pesticides, herbicides, or insecticides during the growing cycle. There are many growers of this crop, and the number is steadily increasing. Usually manufacturers using this plant to make textiles follow up the process by using natural dyes to further reduce the amount of chemicals dumped into our ecosystem.

Even more promising is a new kind of cotton that is grown in the tradition of the Aztecs - coloured cotton. Sally Fox, a biologist,[14] managed to grow it naturally in shades of green and brown. It has the added benefit of not fading (in colour) and in fact, it gets more vibrant after being washed a few times.

SOY SILK

Soy Silk is made from the by-products of the tofu-making process. The liquefied proteins are extruded into fibres which are then spun, and used like any other fibre (woven, knitted, etc.). INGEO™ CORN FIBRE by Dow Chemical Company is created by extracting the starch and then sugars from corn, and processing them to make a fibre, which can be spun into a yarn or woven into fabric.

BAMBOO

Highly renewable grass and it is probably this property that has resulted in its being classified as "eco-friendly". It also has natural antibacterial properties and the fabric "breathes". The resultant cloth is biodegradable.

FORTREL EcoSpun™
It is a polyester fibre made out of recycled plastic bottles which can be made into fleece. Manufacturing this fibre is preferable to creating new petroleum-based fibres, and given the sheer amount of plastic bottles in existence, finding a new use for them is a plus. The fleece that is created is prized by backpackers for its warmth and durability.

PEACE SILK
It is the only silk, which allows as part of the production process the silkworm to live a full life after emerging from the cocoon (used to extract the silk). The silk has an appearance of wool mixed with cotton but is soft and exquisite. This along with its thermal properties makes it perfect for duvet covers and quilts. Peace silk is also breathable, lightweight and long lasting. Additionally, unlike most silks, this variety can be home washed, thus making it an easy care item.

3.3 Regulating Eco-Friendliness

International Governmental Regulation of the Textile Sector

Many countries have adopted environmental standards and requirements restricting the use of harmful chemicals in the production of textile and clothing – these are mandatory and imposed by various laws and regulations.

[14] Brown, David. "Sally Fox: Innovation in the Field- Inventing Modern America, From the Microwave to the Mouse." Foxfibre. 2001 <http://www.vreseis.com/sally_fox_story.htm>.

Case Study: Ban on Azo Dyes

One of the earliest and the best known ban is the 'Second Amendments to the Consumer Protection Act' issued by the German government in 1994 making the use of azo dyes a criminal offence. Azo dyes, used extensively in textile dyeing processes, were found to contain as many as 20 cancer-causing aromatic amines.

The 1994 law prohibited the use of azo dyes in textile products that have direct skin contact for prolonged periods, such as textile garments (even outerwear) and bath towels. It also prohibited the sale of any textile products, the printing or dyeing of which produced any of the banned amines. Two more aromatic amines, which are suspected by the Health Committee of EU to have cancer-causing effects, were also blacklisted subsequently, raising the number of banned amines to 22.

The ban was also extended to pigments based on the banned amines. The German Ministry of Health also finalised a test method for quantification of azo dyes in natural and artificial fibres (cotton, silk, wool, and viscose) and a ceiling of 30 ppm was fixed for declaring a product 'azo-free'.[15]

Shortly afterwards, France and Netherlands followed Germany's example and banned the dyes.

In May 1996 the Ministry of Environment and Forests, GoI went further and prohibited the handling of 70 more azo dyes, which came under the banned category as per the notification published in the Gazette on 26 March 1997.

The Ministry of Environment and Forests prohibited the handling of 42 benzedine based +70 azo dyes, such as 112 dyes, which are capable of releasing any of the harmful amines. The prohibition covers the manufacture, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like of such substance.

The Ministry of Environment and Forests gave 60 days notice to those likely "to be affected by the proposed ban" to file their objections.[16] The proposed ban would put these dyes out of the reach of the highly decentralised dyeing and processing, industry. This would help the textile and leather industry to comply with the ever-increasing demand for eco-friendly and safe clothes in the major importing countries of the West.

The European Union is also taking the necessary steps to enforce eco-standards for textiles by December 2011. By 1 December 2011, producers and exporters will have to notify the European Chemicals Agency (ECHA) if their goods contain hazardous properties of a substance (including dyes and pigments) listed in the candidate list, from the new law "Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH)." The law into force in June 2007 and is being rolled out in phases.

In addition, enterprises manufacturing or importing more than one tonne of a chemical substance per year are required to register the chemical in a central database. The aim of REACH is to replace these potentially hazardous substances with safer alternatives whenever possible. The ECHA is authorized to define restrictions for the use of specific chemicals.[17]

[15] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 2..

[16] "Dressed to Kill No More." India Environment Portal. 14 May 1996. Down to Earth. 2009 <http://www.indiaenvironmentportal.org.in/node/33949>.

[17] "EU Eco-Compliance on Chemicals Arouse Concerns in India." 18 September 2009. Adsale Industry Portal. 2009 <http://www.adsaleata.com/Publicity/MarketNews/lang-eng/article-91595/Article.aspx>.

Indian Governmental Regulation

In India, the regulatory framework-governing the compliance of textile manufacturing units with environmental norms has been in place for many years.[18] The Ministry of Environment and Forests, Government of India and the State Governments are responsible for the formulation of regulations and the monitoring of the industry's compliance to such regulations. The Pollution Control Board has laid down a number of norms regarding permissible ceilings for air and water pollution as well as effluent discharge.

Phasing Out CTC and CFC

In 1992, India became a signatory of the Montreal Protocol, which calls for global cooperation in environmental protection. This formally committed the Textile Committee, Pollution Board and the Ozone Cell of the Ministry of Environment and Forests to the phasing out of CTC (Carbon Tetrachloride) and CFC (Chloro Fluoro Carbons).

CTC is widely used as a degreasing and cleaning agent in the dry-cleaning and textile industries. Every year, Indian textile industry consumes more than 1,500 tons of (CTC) to remove stains from garments, cleaning or degreasing of metal parts and machinery servicing the garment-making machinery.[19]

Ban on Benzidine-Based Dyes

The Ministry of Environment and Forests, Government of India has also prohibited the handling of benzidine-based dyes. In January 1990. The notification was published in the Gazette of the Ministry of Environment and Forests, India As per this notification, as of 1993 the handling of all 42 benzidine based dyes is prohibited.

Information Dissemination Efforts and Infrastructure Development

The Textiles Committee, a statutory body under the Ministry of Textiles, has been seminal in sensitising the Indian textile industry to the implications of the azo ban. The Ministry of Textiles under the Textile Committee, Textile Research Associations (TRA), and Indian Institute of Technology (IIT) has set up 22 laboratories capable of testing textiles, chemicals and dyes for the presence of any banned substance.[20]

Due to the various measures initiated by the Government of India for preventing the use of harmful dyes and auxiliaries by the textile industry, importers are not insisting on test reports clearing each consignment of textiles shipped from India as amine-free. Instead, an undertaking or declaration by the exporter is deemed sufficient.

Similarly, large quantities of textiles are also imported into India. In order to ensure imported textiles are not dyed with any of the 112 dyes prohibited by the Government, the Director General of Foreign Trade (DGFT), in May 2001 issued a public notice No. 12 (RE 2001) 1997-2000 for the testing of all the textile consignments in the eco-laboratories selected by the Textile Committee and Central Silk Board.[21]

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[18] Provisions under the Water (Prevention and Control of Pollution) Act, 1974; Provisions under the Air (Prevention and Control of Pollution) Act, 1981; Provisions under the Environment (Protection) Act, 1986; Provisions under the Environment (Protection) Rules, 1986; National Environmental Policy, 2006 for development of standards (for more details see http://www.indiaenvironmentportal.org.in/files/Guidelines_loaction_stringent_std.pdf)

[19] "India:TexCom and GTZ to Launch Training Programme on CTC Substitutes." 16 December 2005. fibre2fashion. 2009<http://www.fibre2fashion.com/news/textile-news/newsdetails.aspx?news_id=9831>.

[20] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 3.

[21] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 4.

Have Regulations Worked in India

Compliance with the azo ban has had mixed results. This is because dye substitutes are 2.5 times more expensive than the azo dyes previously used and azo-free dyeing increased production costs by 15-20%.[22] Due to the significant increase in production costs involved, it has been noted that compliance is usually occurring only in larger units which cater to export markets that have very strict requirements viz. labels, fair trade certification, etc., like countries in Europe or in the United States. Smaller units, unable to make this sort of investment, are forced to shift to other markets such as Africa where the eco-norms are not stringent.

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In 1999, the Textiles Committee conducted a study to assess the presence of banned azo-dyes in Indian textiles meant for exports as well as sale in the domestic market. Of the 2,845 textile samples, meant for exports tested in the Textile Committee/TRAs laboratories it was found that only 4% contained banned amines. In the case of textiles intended for domestic consumption, the study found that roughly 7% of the samples contained banned amines. Although these figures may show a significant improvement from the early 1990s, dyes containing the banned amines are still in circulation in India and the textile industry is still not complying completely with the existing laws.[23]

Compliance with Governmental Regulations on Environmental Pollution

Most textile production centres in India utilise wet processing techniques (bleaching and dyeing), which use huge quantities of water and different chemicals. The effluents discharged by the units are generally hot, alkaline, strong smelling and coloured and are often toxic. Unfortunately, the majority of the textile industries, especially the smaller units, are not treating their effluents properly and the untreated or partially treated effluents are discharged into water bodies or on land and sometimes the effluent is used for irrigation.

In many clusters around the country, textile effluents have caused serious environmental impacts on local aquatic bio-diversity impacting fisheries, on local water sources for human use as well as irrigation thus affecting human health as well as agriculture.

Most of the small units are using traditional processing technology, which are not environment friendly. Cleaner production (CP) technology like soft flow machines has a lot of scope in textile processing. However, since the soft flow machine is ten times costlier than the traditional winch, it is not affordable for the small units. In order to meet the standards set by the Pollution Control Boards, textile production units have to make large investments in technology up gradation and expertise. Likewise, they also have to pay to obtain certifications and to avail of testing and accreditation services.

Despite the existence of stringent environmental laws and regulations, compliance by the Indian textile industry (especially processing units) has overall been rather poor. This is primarily because the costs have gone up but price realisation has not kept pace, making investing in greener technology and processes unprofitable, especially for producer groups and manufacturers whose operations are either small or medium scale or cater to the domestic market where eco-requirements are not yet particularly stringent.

[22] Mangalam, Shaju. "Eco-labelling Challenges and Opportunities for Indian Textile Industry." Presentation at National Eco-labelling Workshop, Jaipur, India- 23 June 2008 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=7741FDDA-1983-4E8E-9DD2-06E7ED9806CD>.

[23] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 3

If compliance is to be more widespread, manufacturers of dyes, chemicals and textiles as well as processing units need to be educated further regarding the regulations and assisted in conversion to non-polluting materials and processes (the assistance may take the form of technical support, infrastructure-building assistance and/or credit facilities, as found appropriate in context specific studies).

The highly decentralised nature of the Indian textile industry makes enforcing legislation difficult. Further, due to its fragmented and small-scale operations, individual treatment plants in every company are not feasible. Common effluent treatment plants have been proposed as a potential solution – *Common Effluent Treatment Plants* (*CETPs*). CETPs have accordingly been set up in a few clusters but are to find widespread approval.

In addition, state governments and local authorities need to facilitate eco-compliance by textile manufacturers and processing units by way of infrastructural support; such as by supplying enough quality water and earmarking suitable areas for Effluent Treatment Plants (ETPs) and dumping of sludge[24]. Legislations by the Ministry of Environment and Forests also requires a critical re-examination of its coverage as well as enforcement. The roles of the various government organisations involved in the monitoring and enforcement process need to be clearly delineated.

3.4 Eco-Labels

Globalization has unalterably transformed the patterns of production and consumption of textile and clothing products. Unable to compete against the economies offered by emerging economies, many developed countries have adopted protectionist strategies to safeguard their own local industries. Thus, many nations have introduced tariff peaks and tariff escalations in the textile and garment sector. Further, non-tariff barriers – most significantly, eco-labels – have also been introduced. Many developed countries have also created their own eco-labelling schemes and have evolved their own norms for awarding eco-certification.

Simultaneously, published research has expanded consumer awareness regarding the environmental impact of various products and product components. Among them are studies on textiles, which indicated that substances used in textile production processes as well as the residues from fertilisers and pesticides used for fibre cultivation could have adverse effects on the health of the wearer, especially infants and children.

Such increases in consumer awareness – in the textile sector as well as others – have led to the emergence of "green" market segments. The emergence of the green consumer helped force companies to look into the impact on the environment of their operations and products. Many companies have tried to win customers by capitalising on their concern for the environment. However, they often do this by only changing their style rather than substance. Consumers were bombarded by labels declaring products as "eco-friendly," "environmentally safe," "recyclable," "biodegradable," "ozone-friendly," "safe for landfills," "reusable," "green," "organic," "natural," etc.

A 1996 study by Consumers International found many instances of misleading environmental claims in Central and Eastern Europe. A study by three United States universities found that terms such as "environment-friendly' were being used thrice more often in 1995 than 1992.[25] As a result, third-party certification in the form of eco-labels was born as a means

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[24] "New Directions." The Hindu, Bangalore 22 February 2008
[25] "The Colour of Money." Down to Earth 15 April 1998.

of providing environmentally conscious consumers with reliable information regarding the environmental impact of the products they are purchasing.

The world's first eco-labelling was initiated by Germany in 1978. Canada, Japan, and the United States established eco-labelling schemes in the late 1980s. Many other governments, along with privately-operated labels were launched during the 1990s. Today, eco-labelling is being implemented in more than 30 countries.

Usefulness of Eco-Labels

Labels, as well as labelling programmes, serve a variety of purposes and target different audiences. These include:

- **Provision of business-to-business information:** Material Safety Data Sheets (MSDS), hazard communication schemes, etc. provide business-to-business product-specific environmental information to industrial customers/workers on the health, safety and environmental effects of the products they purchase/ use. They also encourage the purchasing parties to use and dispose of these products appropriately to reduce waste and minimises their functional impact on human health and environment.

- **Enhancing market opportunities:** In the context of the retail market, eco-labels serve as a tool by which businesses can reinforce or identify and establish niche markets. This is especially true of the export market in which, following the liberalization of the textile market in 2005, eco-labels are seen to offer a potential market advantage for those seeking to maintain exports to European countries where high value is accorded on the evidence of sound ecological processing.

- **Generating consumer awareness:** Market forces have impelled manufacturers to move towards "green'" technologies and materials but the resultant products are often priced higher than comparable non-eco friendly products. The additional costs coupled with doubts regarding the genuineness of the manufacturer's claim of eco-friendliness deter many consumers. Eco-labels provide some measure of validation to the manufacturer and assure customers of the authenticity of the product.

- **Improved product quality:** Eco-labels take into consideration the use of the textile or product and address issues such as textile shrink resistance and colour resistance, which translate into better and more durable products for the consumer.

- **Competitive advantage:** Eco-labels create a positive brand image among consumers thereby allowing a competitive advantage (and possibly compelling other businesses to follow suit).

- **Improved environmental and health performance:** Eco-labels have also been far more successful than regulations and laws in effecting environmental and health protection as well as pollution control. Most eco-labels have stringent criteria, thereby impelling manufacturers to design and develop environmentally friendly products and to reduce their carbon footprint.

- **Financial savings:** Improvement and process optimization over the life-cycle results in savings on water, chemicals and energy utilization which in turn translate into substantial long term savings for the manufacturer.

- **Steps towards ISO 14001 and ISO 9000:** When product eco-labelling is an integral part of quality control procedures, it is easier to implement ISO 14000 and ISO 9000 systems.

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- **Facilitate increasing environmental friendliness in the long term:** Generally, eco-labelling criteria are set to reward only the top environmental performers in a product category. Most programs gradually and incrementally raise standards to encourage producers and service providers to keep pace with new and emerging performance improvement opportunities and market shifts.

How Eco-Labels Work[26]

Consideration of the life-cycle analysis (LCA) of a product commencing with extraction or acquisition of raw materials, production, distribution, utilisation and maintenance, and concluding with the disposal after utilisation, are assessed. Transportation of materials and finished goods, use/re-use/recycling of waste materials and energy supply systems are also included in this analysis.

Such studies assist companies in critically reviewing all aspects of their operations and integrating energy-efficiency into their overall decision-making process. LCA encourages careful product scrutiny and is deemed the scientific way to advice customers about the environmental burdens of the product.

'Human ecology' is considered because the product is tested for toxic/allergenic compounds that are detrimental to human health. Environmental health hazard such as ozone depletion or pollution caused by the product are also included within the scope of these tests. Certain labels also target social concerns such as child labour in their award criteria.

Consideration of "fitness of purpose" and overall performance is factored in once comparable quality and performance of the product under consideration has been established. Therefore, it is important that eco-labels address the quality and performance of a product that is to be considered for eco-labelling without which the credibility of the eco-label and labelling programme can suffer.

Sound scientific and engineering principles are necessary and the criteria stipulated by the label must be credible, relevant, attainable and verifiable.

Independent verification is critical, requiring a credible eco-labelling program, which is operated by an organisation independent of vested commercial interests. All stakeholders should find adequate representation in the programme.

Open and accountable process is important at each step of the certification process. Fair, consistent and uniformly applied procedures must be established. Public access to criteria review is an essential feature of an open process.

Finally, environmental award criteria and categories must keep pace with technological and market changes.

Implementation of Eco-Labels[27]

At application, the applicant must report the trade names and identification or reference numbers of the products in question. All chemicals used for the eco labelled product must be reported in the application, as well. When the Competent

Sound scientific and engineering principles are necessary and the criteria stipulated by the label must be credible, relevant, attainable and verifiable.

[26] "ISO Standards." 2009. International Organization for Standarization (ISO). <http://www.iso.org/iso/iso_catalogue.htm>.

[27] Commission's Decision of 15 May 2002 establishing the ecological criteria for the award of the Community eco-label to textile products' (2002/371/EC) ("Commission Decision of 15 December 2008 amending Decisions 2001/405/EC, 2002/255/EC, 2002/371/EC, 2002/740/EC, 2002/741/EC, 2005/341/EC and 2005/343/EC in order to Prolong The Validity of the Ecological Criteria for the Award of the Community Eco-Label to Certain Products." 19 December 2008. European Union. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:340:0115:0116:EN:PDF>.)

Body has processed the application, a contract specifying range of products and chemicals permitted is granted.

It is recommended at the time of application to limit the number of chemicals and suppliers as far as possible, as this will ease the application procedure for the applicant considerably. In case the contract holder wants to extend his range of products, certain conditions need to be met.

The applicant for all relevant criteria must compile documentation. For this purpose, the manual contains pre-made forms of declarations and test reports stating the information needed. Two different levels for declarations are often used, declarations from the applicant/producer and declarations from the supplier. All relevant documentation has to be sent to the Competent Body together with the application.

Choice of analytical laboratory to do analysis of chemicals and emissions to be carried out by laboratories, which are accredited in accordance with the requirements in ISO 17025 or its equivalent. Alternatively, the used laboratory has to be accepted by the Competent Body. The applicant must give information on the laboratory used including whether the laboratory is accredited according to the above-mentioned standard.

The choice of test method indicated in the criteria document and manual should in principle be used for testing. Test methods different from those reported in the criteria could be accepted only if it can be substantiated that it is equivalent to the required method. For those criteria where no specific test method is required the applicant must give information on the principles and sensitivity of the test method used.
Test periods and test frequency is responsibility of the contract holder to ensure that products are in continuous compliance with the eco-labelling criteria. The necessary test frequency depends on the way of production it must be explained how often samples for test are taken. For criteria where the annual average is not allowed to pass a given threshold, the annual average should as a minimum be based on three measurements.

Continuous control is the responsibility of the applicant towards product performance, which complies with the eco-labelling criteria. After an eco-label has been granted, the applicant must keep the dossier up to date. In case where continued tests or measurements are required the contract holder or his supplier is responsible for keeping a journal on the test results and the corresponding documentation. This documentation needs not to be sent to the Competent Body, but must be available at any time, if requested.

Control with compliance of criteria to be undertaken with both the product group criteria and the terms of use and provisions of the contract. To this end, the Competent Body may request, and the holder shall provide, any relevant documentation to prove such compliance. Further, the Competent Body may, at any reasonable time and without notice, request, and the holder shall grant, access to the premises.

Costs towards all expenses for tests and verifications related to the application, holding and use of the eco-label to be borne by the applicant.

The procedure for assessing the application is examined by the Competent Body that includes possible material sent directly from the suppliers. The Competent Body can ask for further information, if necessary. After all documentation has been approved, the Competent Body carries out an on-site visit to the applicant and/or his/her suppliers. When all requirements have been met, the Competent Body notifies the application to the Certifying agency who registers the contract.

Comparative Sampling of Various Eco-Labels

There are several eco-labels, each with their own criteria, scope, and certifying body. They are listed below

- Blue Angel (1978) – National German label, is the oldest eco-label
- EU Flower (1992) - Multinational label for textile products, used by 83 companies
- Nordic Swan Eco-label (1989) – Multinational label for textiles and washable diapers
- Oeko-Tex standard 100 - Germany and Institutional label, used by 20,000 companies
- Eco Mark (1991) – National Indian label from baby clothing, adult clothing, home textiles, stockings and hessians
- Eco-mark (1989) – National Japanese label for cloth diapers (used for 24 products and nine companies), unbleached clothes, bed linen and towels (used for 68 products by 55 companies), cloth shopping bags (used for 53 products by 27 companies), textiles made of waste fibres (used for 122 products by 91 companies), and clothing made of used PET Polyethylene terephthalate) resin
- Green Mark (1992) – National Taiwanese label for cloth diapers and non-bleached towels
- Green Label (1994) – National Thai label for products made from cloth
- Environmental choice (1991) – National label for Australia and New Zealand for wool carpets
- KELA (1994) – National Korean label used for seven clothing products by three companies)
- SKAL India - a branch of "Control Union World Group," a Netherland based private company, issues 200 organic certifications and 250 textile certifications
- Austrian Eco-label (1991) – National Austrian label for textile floor coverings

The most stringent eco-label criteria are attributed to the German/Austrian eco-labels (e.g., NaturTextil IVN). NaturTextil formulates environmental criteria, social criteria as well as quality criteria. In addition, the highest quality labels (such as NaturTextil) have environmental criteria, which already cover the early stages of production, namely standards on organic production of textile raw materials.

The criteria for product types set the standards for clothing. Within the category of clothing, the standard for baby clothes is the highest. Moreover, the standards for clothing (underwear) are stricter in comparison with top clothing (e.g., a coat or a hat), because under clothing is in direct contact with the skin. In making such distinctions in the environmental criteria, the German/Austrian eco-labels lead with the Öko-tex label. [28]

The Indian Eco Mark

The Indian government launched a voluntary eco-labelling scheme named "Eco Mark" in February 1991[29] with the earthen pot or *matka* as the symbol. The launch of the scheme was driven by concerns about adverse environmental impact of consumer products, especially in disposal of garbage. The scheme also seeks to encourage sustainable management of resources and thereby improve the quality of the environment. It also was designed to meet the need for

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[28] De Jonghe, Frederik. "Eco-labels for textile products'." 2009. Hogeschool West-Vlaanderen. 2009 <http://dspace.howest.be/bitstream/10046/534/3/abstract.pdf>.

[29] The Ministry of Environment and Forests, Government of India instituted a scheme on labelling of Environment Friendly Products through Gazette Notification No. 71, 21 February 1991 <http://www.mppcb.nic.in/ecomark.htm>.

clear and credible guidance regards products that are eco-friendly.

Eco Mark is similar in many ways to eco-labels of other countries. However, it differs in one important aspect -eco-labels are awarded for consumer products that meet the environmental criteria. The Indian Eco-mark is awarded for products that meet both environmental and quality criteria of Indian standards. Eco-labelling of eco-friendly services are not included under the scheme.[30]

Unlike the EU Flower Mark, the criteria for the Indian Eco Mark are not very specific. The basic criteria covers broadly both environmental aspects and quality. However, at the production level it is more specific. The environmental assessment for the product states explains that the product:

- should have substantially less potential for pollution than other comparable products in production, usage and disposal
- should be recycled, recyclable, made from recycled products or bio-degradable, where comparable products are not
- should make significant contribution to saving non-renewable resources including non-renewable energy sources and natural resources compared with comparable products
- must contribute to a reduction of the adverse primary criteria which has the highest environmental impact associated with the use of the product, and which will be specifically set for each of the product categories[31]

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The general product requirements stipulated by the Eco Mark address:

- compliance with the pollution control norms set out by the Pollution Control Board and the Environment Protection Act
- raise environmental awareness among consumers
- safety, quality and performance of the products

The stipulations examine the entire production process including the[32]:

- source of raw materials
- use of natural resources
- likely impact of the product on the environment
- energy conservation in the production of the product
- affect and extent of waste arising from the production process
- disposal of the product and its container
- utilisation of "waste" and recycled materials
- suitability for recycling or packaging
- biodegradability of the product

The three committees involved in developing the criteria development and awarding of Eco Mark are the Steering Committee, Ministry of Environment and Forests, the Technical Committee, Central Pollution Control Board, and the Sectional Committees of the Bureau of Indian Standards (BIS) and/or Directorate of

[30] Mehta, Pradeep S. "The Indian experience with the Eco-Mark: lessons learnt and steps Forward." Presentation at National eco-labeliing Workshop, Jaipur, India- 23 June 2008 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=8F67E40F-AF5F-4418-B0EB-ECB5C7FE4CBD>.

[31] "Eco-Mark Schemes of India." Central Pollution Control Board. National Law School of India University, Bangalore, 2009 <http://www.nls.ac.in/CEERA/ceerafeb04/html/documents/ecomarkindia.htm>.

[32] "Eco-Mark Schemes of India." Central Pollution Control Board. National Law School of India University, Bangalore, 2009 <http://www.nls.ac.in/CEERA/ceerafeb04/html/documents/ecomarkindia.htm>.

Marketing.[33] Because of this three-tiered bureaucratic system[34], implementation of the Eco Mark scheme is rather complex.

The Steering Committee initially decides the category of products for coverage under the Scheme. Then the Technical Committee or sub-committees set up by the Technical Committee develop the desired criteria. The draft criterion is placed before the Steering Committee for comments. The comments are sent back to the Technical Committee. The revised draft is then sent to the Steering Committee who notifies it for public comments. The Technical Committee includes these comments and finalises the criteria. The criteria list is returned to Steering Committee for final notification. The BIS, finally translates the product specific specifications into Indian Standards for the Eco Mark certification.

Eco Mark and the Lack of Popularity Among Indian Textile Manufacturers

In spite of being in existence for 16 years, the Indian eco-label has not really caught on with buyers. Currently, only 12 manufacturers in India have been awarded the Eco Markfor products such as paper, paper pulp and paper board.[35] However, not a single product carries the mark. Godrej Soaps was awarded the mark for their brand Eezee but has subsequently allowed its license to lapse.[36] According to the 2006 version of "Compendium on Eco-Labels" the numbers of textile companies certified under ISO 14000 in India are near 20.[37]

India has not a single Eco-mark certified producer of textiles. Producers feel the Eco Mark does not give them any perceptible benefit as there is limited consumer awareness regarding the Eco Mark, the application process and criteria requirements are cumbersome and difficult.[38]

Further, producers generally feel the Eco Mark is not globally recognised and will therefore not be accepted as sufficient certification by their overseas clients. Therefore, given the fact that there is insufficient demand for eco-friendly products in the internal market and no public recognition of the Eco Mark, manufactures do not consider investment in a label worthwhile.

However, the Ministry of Environment and Forest is earnestly working to revive the scheme in the light of the National Environment Policy Statement of India adopted in 2006. The policy recognizes the role of eco-labels in promoting conservation of environment. It also states that action would be taken to formulate "Good Practice Guidelines" for eco-labels to enhance their scientific basis, transparency and requirements of participation, and at the same time promote the mutual recognition of Indian and foreign eco-labels, which adhere to the Good Practice Guidelines, to ensure that Indian exporters enhance their market access at lower costs.[39]

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[33] It should be noted that there are two consumer groups in the Steering and Technical Committees of this three tier implementation system but not a single environmental group is included

[34] For more information about the composition and role of the various committees involved, see "Ecomark." Madhya Pradesh Pollution Control Board, 2009 <http://www.mppcb.nic.in/ecomark.htm>.

[35] Mehta, Pradeep S. "The Indian experience with the Eco-Mark: lessons learnt and steps Forward." Presentation at National eco-labeliing Workshop, Jaipur, India- 23 June 2008 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=8F67E40F-AF5F-4418-B0EB-ECB5C7FE4CBD>.

[36] "The Colour of Money." Down to Earth 15 April 1998.

[37] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 5.

[38] Mehta, Pradeep S. "The Indian experience with the Eco-Mark: lessons learnt and steps Forward." Presentation at National eco-labeliing Workshop, Jaipur, India- 23 June 2008 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=8F67E40F-AF5F-4418-B0EB-ECB5C7FE4CBD>.

[39] Thumbarathy Balakrishnan, Simi. "Eco-Labelling Indian Textiles." ESTIS. CUTS International, 2009 http://fr1.estis.net/sites/eco-label/default.asp?site=eco-label&page_id=7B235227-39B0-4F5D-9867-EA621BAFEEBC>.

Compliance with Foreign Eco-Label Regulations

The most wide-spread labelling scheme for Indian textile is the German Oeko-Tex certification which can be judged an 'ISO type I like' label taking mostly health aspects into account.

The competitive nature of the global market has made many retailers rationalise their supplier base to include only those producers who can meet the demanding requirements for quality, price and turnaround times without compromising on environment and social standards. Brand value is becoming increasingly central to many clothing retailers and consequently, protecting their reputations against allegations of poor environmental or social practice along the supply chain. These factors, combined with a fear of losing export markets is proving to be one of the major motivations for companies to shift towards environmentally benign and socially responsible processes and materials.

It has also prompted a small percentage of the Indian textile industry to seek validation from independent international/ multinational eco-labels (for example, Oekotex 100, Ecotex, and the Control Union). These producers thus comply with the stringent requirements for the product and its manufacturing process. Subscription to such labels serves as an effective tool in enhancing the market share of the companies. It also arguably leads to operational efficiency by way of optimum utilisation of resources and therefore improves the bottom line of the company.

In June 2007, there were 274 manufacturers in India with Oeko-Tex certificates selling their products worldwide

The most wide-spread labelling scheme for Indian textile is the German Oeko-Tex certification which can be judged an 'ISO type I like' label taking mostly health aspects into account. According to the Indian National country study the label brought several market advantages to Indian textile industries. The marketing department could get an 8-10 percent higher price due to Oeko-Tex and overall quality improvements form their buyers. Additionally, the market widened by 10% in the first year. In June 2007, there were 274 manufacturers in India with Oeko-Tex certificates selling their products worldwide.[40]

The EU REACH plan, being rolled out in phases and intended to be enforced by December 2011 is slated to have significant implication on exports of apparel, textiles and textile polymers from India to the EU. Indian players are advised to pay more attention to eco-compliance as the penalties levied under REACH could be severe. The penalties can go as high as 75,000 Euros per consignment or having the entire shipment burnt. Failure to comply could lead to a reduction in the market share for Indian textile players - India exported nearly 47% of its garment production to the EU in 2008-09, worth US$5 billion.[41]

[40] Gold, Stefan, Frieder Rubik and Dirk Scheer. "Enabling Developing Countries to Seize Eco-Label Opportunities: Project Background Paper." ESTIS. January 2008. Institute For Ecological Economy Research. 2009 <http://fr1.estis.net/includes/file.asp?site=eco-label&file=095D12FB-67BD-4D63-AB99-43C4BAA84C73>.

[41] "EU Eco-Compliance on Chemicals Arouse Concerns in India." 18 September 2009. Adsale Industry Portal. 2009 <http://www.adsaleata.com/Publicity/MarketNews/lang-eng/article-91595/Article.aspx>.

4. INDIAN MARKET FOR ECO-FRIENDLY AND SUSTAINABLE TEXTILES

The Indian eco-friendly textiles market is at a nascent stage. A bird's-eye view of the market shows that there is an absence of any significant player selling products with eco-friendly tags. Unlike in the West, there is not a single eco-label operating in the domestic textile market. For customers, there is hardly anything being offered in the name of eco-friendly or sustainable textile products. The average textile retailer does not know what eco-friendly textiles are and at best, may view handloom, pure cotton or Khadi as eco-friendly.

However, a closer look would tell that there is a segment, which is trying to use 'eco-friendly' as the unique selling point (USP). The recent retail boom has shown that there is large segment of aware people especially middle class who have good disposable incomes and are willing to experiment. Consequently, there is lot of interest amongst some of the bigger players as well to use the 'green' tag.

As an Indian, one would like to believe that there are many eco-friendly products which are selling in the market but not with an explicitly eco-friendly 'pitch'. There are different connotations to the word "eco-friendly" and in the absence of any label or standardized process, there are multiple products in this segment which are being pitched and sold as eco-friendly products by multiple players wherein the entire responsibility is on consumer to decide whether the product is actually eco-friendly or not.

Before going into the details of the market for eco-friendly textiles, it would be worthwhile to take an overview of the textile and clothing market in the country.

4.1 Overview of Indian Textile and Clothing Market[42]

Today the size of the domestic market for textile and clothing industry is worth almost Rs. 175,000 crores, which is far bigger than the market size of automobiles, telecom, consumer electronics and durables, and Fast Moving Consumer Goods (FMCG) sectors.[43]

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Currently, the Indian textile sector has been primarily focused on exports (and the many fiscal benefits that come with it). This has led to the gross neglect of the equally promising domestic market opportunity. During most of the 1980s, 1990s and into the early 2000s, the domestic sector was beset with regressive government policies.

As of now, it has been mostly traditionally large textile producers or new entrepreneurs who have looked at the domestic market. In Dec 2008, Textiles Committee published the findings of the national household survey which give the following estimates for the Indian textiles and clothing market in India.

Market Size in the Household sector

- In 2007, the per capita consumption of textiles was 22.41 metres while in 2006, the per capita consumption was 21.49 metres, recording a growth of 4.28%
- During 2007, the average Indian consumer spent Rs. 1,488.39 on the purchase of TEXTILE AND CLOTHING (a growth of 6.99%)

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[42] National Household Survey 2008: Market for Textile and Clothing. New Delhi: Textile Committee, Ministry of Textile, Government of India, 2008.
[43] Singhal, Arvind. "Making the Textile Sector Fashionable." Business Standard 7 May 2009 <http://www.business-standard.com/india/news/makingtextile-sector-fashionable/357355/>.

- In 2007, the Indian textile market grew at a rate of 8.81% and its size was Rs. 1,692,952
- Out of total consumption (in terms of quantity) of the man-made and blended/mixed textiles taken together make up 60.08% of the market
- Pure cotton textiles and clothing compose 38.95% of the market, whereas pure silk and woollen products have a meagre market share of 0.62 % and 0.35 % respectively.

Table 5: Product-Wise Market Sizes in 2007[44]

Product	Volume		Growth rate (%) for Previous Year
	2006	2007	
Shirt	399 million pieces	419 million pieces(Pure cotton: 28.88%)	5.01%
Shirting	1648 million metres	1,817 million metres(Pure cotton: 9.25%)	10.25%
Trousers	292 million pieces	314 million pieces(Cotton: 26.75 %)	7.53%
Jeans (Male)	163 million pieces	173 million pieces(Rural: 57%)	6.00%
Jeans (Female)	8 million pieces	9 million pieces	12.50%
Coating and suiting	558 million metres	564 million metres	1.08%
Salwar-kameez	319 million pieces	339 million pieces(Cotton: 25.37%)	6.27%
Dhoti	128 million pieces	117 million pieces(Cotton: 72%)	-8.59%
Sari	1612 million pieces	1720 million pieces (Cotton: 22.90% and Silk: 1.63%)	6.70%
T-shirt (Male)	165 million pieces	179 million pieces	8.48%
T-shirt (Female)	11 million pieces	13 million pieces	18.18%
Chaddar	122 million pieces	127 million pieces(Cotton: 96%)	4.10%
Bed sheets	148 million pieces	156 million pieces (Cotton: 93%)	5.41%
Towel	387 million pieces	400 million pieces	3.36%
Terry towel	13 million pieces	15 million pieces	15.38%

It is difficult to give any facts regarding the market for eco-friendly textile products out of the huge textile market in the country. Thus, it would be good to start by discussing the findings of the primary research and then summarise the overall findings, in terms of the nature and structure of the eco-friendly market.

4.2 Market Perspective

The Research Team carried out market visits in four metros, cities where a large number of eco-friendly textile products are available. This section details the key findings of the primary research.

Key Players

In the four cities studied, it was found that broadly the market players could be divided into three categories:

- Category A: Claim and sell their products as eco-friendly
- Category B: Products perceived as eco-friendly, but do no make any eco-friendly claims
- Category C: Products not sold or perceived as eco-friendly

[44] National Household Survey 2008: Market for Textile and Clothing. New Delhi: Textile Committee, Ministry of Textile, Government of India, 2008.

Category A: Selling Products as Eco-Friendly

One focus area of the research was to learn more about the market players who are pitching their products as eco-friendly. An analysis of the 26 Category A players is presented below in Table 6. They have been categorized on the basis of their total annual revenue using the following parameters: Tiny- upto 50 lakhs; Small- 51 - 100 lakhs ; Medium- 100 - 200 lakhs; Large- 201 lakhs - 500 ; and Very large- more than 500 lakhs:

Tqble 6: Basic Profile of Key Players Selling or Having Eco-Friendly Products in Their Product Range[45]

City	Organisation	Retail	Supply	Manufacture	Export	Size
Bengaluru	Bombay Swadeshi store	☺				Very Large
Bengaluru	Chaya Nisarga		☺	☺		Tiny
Bengaluru	Deepika Govind	☺		☺		Medium
Bengaluru	Desi	☺		☺		Medium
Bengaluru	Mother Earth	☺	☺			Large
Bengaluru	Serenity	☺		☺		Tiny
Bengaluru	Hands of India	☺	☺		☺	Tiny
Bengaluru	Sarga Eco-textile		☺	☺	☺	Tiny
Bengaluru	Zeme	☺	☺		☺	Tiny
Delhi	Eco Tussar Silk		☺	☺	☺	Medium
Delhi	Floor n Furnishing	☺	☺	☺	☺	Large
Delhi	Mura Collectives		☺	☺	☺	Medium
Delhi	People tree	☺		☺	☺	Small
Delhi	The MaxiMum store	☺		☺		Tiny
Delhi	Alps Industries		☺	☺	☺	Very Large
Kolkota	Sasha	☺		☺	☺	Large
Kolkota	Red Oranges	☺		☺	☺	Large
Kolkota	Shopper Stop	☺				Large
Kolkota	Bani Thani	☺				Tiny
Mumbai	Raymond Ltd.	☺		☺		Large
Mumbai	Alok Industries	☺	☺	☺	☺	Large
Mumbai	Adya International		☺	☺		Tiny
Mumbai	Baaya Design	☺		☺		Tiny
Bengaluru	Lifestyle International (P). Ltd	☺				Very Large
Mumbai	Matayasa	☺		☺		Tiny
Delhi	Dastakri Haat Samiti	☺		☺		Large

As per the size of the firms, there are 5 very large players (public limited companies or companies with huge turnovers), 6 large, 4 medium, and 2 small and 9 tiny ones.

Category A.1 Majorly Retailing

This category includes the five retailers who are retailing either one or all of their products as eco-friendly. This is the least populated category in the survey, because there are not enough players who are involved in just the retailing function of the eco-friendly products. Two basic patterns emerged:

[45] Data from primary market research

- **Retailing of only eco-friendly products:** Mother Earth, a new retail chain, is a clear stand out. Mother Earth is a joint venture between Indus tree and Future Group and claims to be the first green store. It started in March 2009 and it plans to launch 40 stores in the next couple of years. All its products will be sold as eco-friendly. It is a unique mix between a large sized retailer and an eco-friendly product manufacturer to tap this new market segment. Mother Earth also plans to supply its range of products to other prominent and major retailers in the country.

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- **Retailing with one or more eco-friendly line of products:** This segment comprises of large retailers like The Bombay Stores, Shoppers' Stop, Lifestyle who have only few products being strictly sold as eco-friendly. The entire size of this product line is completely insignificant to their overall size of the business.

Category A. 2 Retailing and Manufacturing

There are eight actors in this category. They only engage in manufacturing and retailing. There are variations with respect to the share of their products being manufactured in a captive manner or being directly procured from the primary producers or artisans. There are two large players (Raymonds and *Dastakaari Haat*), two medium (Deepika Govind and *Desi* of Bangalore) and four tiny enterprises (Serenity, MaxMum Store, *Baaya* Design and *Matasya*).

Most of the large players have the background of exports and later entered the domestic market, such as Alok Industries, Red Oranges, and F & F. Red Oranges, which is now a small retail shop in Kolkata, is an experienced exporter of organic fabric.

- *Desi*, Raymonds and Deepika Govind have a common form of manufacturing. They either do not accept supplies from others or sell all the items under their own brand. *Desi* pitches all their products as eco-friendly, while the other two only pitch a small segment of their products as eco-friendly.

- Of the tiny players, except for *Dastakaari Haat*, retailing is not dependent on their supplies. They accept supplies from producer who agree with their ideology. In all these cases, all or majority of products are pitched as eco-friendly.

Category A.3 Retailing and Exporting

This category deals with actors who are largely into retailing or export, carrying out both functions. Most of the players engage in manufacturing, supplying or both. Of the seven players in this category, four were large, one small and three tinyin terms of total turnover.

- **Started retailing with export background:** Most of the large players have the background of exports and later entered the domestic market, such as Alok Industries, Red Oranges, and F & F. Red Oranges, which is now a small retail shop in Kolkata, is an experienced exporter of organic fabric. F & F is an exception in this category, not all of its products are eco-friendly. Alok and F& F are also undertaking all the four functions (retail, supply, manufacture and export)

- **Exports as additional line of work:** Sasha, Zeme, People Tree and Hands of India focus on the domestic market and exporting, equally. The tiny actors are start-ups, exploring all the possible markets. For Zeme and Hands of India, retailing composes a small aspect; the majority of their effort is focused on supplying.

Category A.4: No Retailing

The research showed six players in the market who do not have a retail outlet for their products and are primarily involved with manufacturing or supplying or exporting. Some of them, however, do sell their products through exhibitions. Out of six, there is only one very large player, Alps Industries. Alps are industry leaders in eco-friendly dyes and also manufacture home furnishings and fabric and are beginning to venture into the domestic market with their eco-friendly products.

The other two, Eco-tussar and Mura Collectives are completely focused on eco-friendly products and supply popular retail chains like FabIndia as well as export their products.

Chaaya Nisarg deals with coconut shells and is an exception in this category with respect to its product.
Adya International and Sarga Eco-Textile are tiny players who are still trying to find their in the market.

Category B: Products Perceived as Eco-Friendly

Some of the selected stores under this category are known as large players either at the national or regional level. An analysis of the five Category B players is presented below:

Table 7: Basic Profile of Some Key Players Whose Products are Perceived as Eco-Friendly[46]

Location	Organisation	Retail	Supply	Manufacture	Export	Size
National	Maspar	☺		☺	☺	Very Large
Bengaluru (Regional)	Swadeshi Store	☺	☺	☺	☺	Large
National	HHEC (buying House)	☺			☺	Very Large
Kolkotta (Regional)	Weaver's Studio	☺	☺	☺	☺	Large
National	Anokhi	☺		☺	☺	Very Large
National	FabIndia	☺		☺	☺	Very Large

None of the players are small or tiny in this segment. Additionally, all the players except HHEC are involved in retailing and manufacturing. HHEC is largely a buying house and a support organisation.

Also, all the players export their products and have done well in the domestic market as well. They have dedicated manufacturing facilities, clusters, or group of producers.

Only two (Swadeshi and Weaver's Studio) both of which are regional retailers, supply products at the national level whereas others have their own brands and largely sell their products through their own retail chains.

Category C: Products Not Sold or Perceived as Eco-Friendly

This category is comprised of players who are product leaders, those that recently launched in the same product range category or who have experimented with eco-friendly products in past. An analysis of the seven Category C players is presented next page:

[46] Data from primary market research

Table 8: Basic Profile of Some Normal or Similar Market Players[47]

City	Organisation	USP	Retail	Supply	Manufacture	Export	Size
Bengaluru	Nalli Lavanya	Designer, Traditional	☺		☺		Medium
Bengaluru	Svisti	Designer, Traditional	☺	☺		☺	Medium
Delhi	G - line Creations	Natural, Cotton		☺	☺	☺	Medium
Delhi	Good Things	Traditional, handloom but power loom manufactured	☺		☺	☺	Large
Delhi Large	Jagdish stores	Premium, Luxury,	☺	☺		☺	Very
		Ethnic, Handcrafted					
Delhi	The Shop	Traditional, Indian	☺	☺		☺	Medium
Kolkota	Ekru Alluring Designs	Designer ware; eco-friendly tried but discontinued	☺		☺		Medium

All the players in this group are either in the luxury, designer ware, traditional or handcrafted category. However, their products are not eco-friendly, nor are they being sold or perceived by consumers as eco-friendly. In addition, all these players are known in their particular city and could, if desired be integrated into the eco-friendly domain. Some, like G-line and Ekru, did launch an eco-friendly line of products, but discontinued them after receiving a poor response. The feedback from these players helped in understanding the nature and size of the market in the four cities.

What Sells as Eco-Friendly in the Market

The Research Team divided the textile and clothing products range into three broad categories:

1. Garments (including fabric)
2. Furnishings
3. Accessories

Overall, there are very few products in each category, in terms of volume, which are purely selling as eco-friendly whereas if the different connotations are attached, then there is a significant chunk which is being sold. Based on the data collected from market visits, the following products are being sold by different players as per their size:

[47] Data from primary market research

Table 9: Products Being Sold as Eco-Friendly by different Players (as per their size)[48]

Organisation	Garments (including fabric)	Furnishings	Accessories
Products Being Sold as Eco-Friendly by Very Large Players			
Bombay Swadeshi store	In Bengaluru had kept organic denim but had to withdraw due to poor response	NA	Bags made from banana and other natural fibre
Alps Industries	NA	Entire range but with limited offering in domestic market	Dyes, Paschima shawls
Shopper Stop	In Kolkata reported selling vegetable dyed clothing in summer	Had introduced eco-friendly range couple of years ago but had to withdraw due to poor market response	Bags
Raymond Ltd.	NA	Launched a premium furnishing store "Be Home," where all the products are pitched as eco-friendly	NA
Lifestyle	NA	NA	Bags
Products Being Sold as Eco-Friendly by Large Players[49]			
Mother Earth	Is modelled as a modern eco-friendly super store and contains all kinds of products in all the three categories		
Floor n Furnishing	NA	Exporter and now a large retailer in north India, has entire range	NA
Sasha	Using vegetable dyes in some of its products in all three categories		
Red Oranges	Currently selling infant wear & bedding as organic		NA
Alok Industries	An international retail chain willing to enter domestic market- has an entire range but still to find avenues and had retail outlet in Mumbai and tie-ups with organic farmers		
Dastakri Haat Samiti	Sells entire range as handcrafted and traditional. Believes that all their product range are eco-friendly		
Products Being Sold as Eco-Friendly by Medium Players[50]			
Deepika Govind	Designer collection in Women's wear and Men's wear-had introduced organic and alternate natural fibres like corn as one line	NA	NA
Desi	Khadi kurtas and garments for men and women	Curtains, bed sheets, bed covers, towels (limited)	Bags, stoles, scarves but limited
Eco Tussar Silk	Supplies silk fabric, sarees and other garments	Silk based furnishings	NA
Mura Collectives	Men's and women's wear which uses natural cotton and dyes	NA	NA

[48] Data from primary market research
[49] Data from primary market research
[50] Data from primary market research

Organisation	Garments (including fabric)	Furnishings	Accessories
Products Being Sold as Eco-Friendly by Small Players[51]			
Bani Thani	Men's and women's wear (designer wear)		Scarves, stoles, etc
People tree	Women's wear		
Products Being Sold as Eco-Friendly by Tiny Players[52]			
Chaya Nisarga coconut shells	NA	NA	Artefacts out of
Serenity	Men's and women's wear; designer wear	Very limited	Stoles, scarves, shawls
Hands of India	Women's wear	Carpets, rugs, floor mats,	Stoles, scarves, shawls
Sarga Eco-textile	Fabric	Soft throws, table cover, cover sheets, upholstery	NA
Zeme	Men's, women's and children's wear	Plans to include	NA
The Maximum store	Women, kids and maternity	Cushions	Bags, stoles, lamps
Adya International	T-shirts	NA	Bags, stoles
Baaya Design	Men's, women and kids	Common products in this category	Stoles, scarves
Matayasa	NA	Fabric, cushion covers, bed sheets, etc	Stoles, scarves, bags

In the domestic market as of now, no eco-labels are being used as a marketing strategy. Instead, producer groups stake their own claims or brand associations to eco-friendliness, capitalising not on absolutist criteria of what constitutes eco-friendly but on consumer perceptions of eco-friendliness.

What is the Pitch to Consumers?

In the domestic market as of now, no eco-labels are being used as a marketing strategy. Instead, producer groups stake their own claims or brand associations to eco-friendliness, capitalising not on absolutist criteria of what constitutes eco-friendly but on consumer perceptions of eco-friendliness.

- **Fibre related marketing tags:** Organic (*khadi*) made from natural fibre, chemical-free, ahimsa textile
- **Process related marketing tags:** Uses natural dyes, ozone-friendly, azo free dyes hand block printed, hand-woven, handmade, recycled, or bio-degradable
- **Social factor related tags:** Made by tribals, or made by craftspeople or made by disabled people
- **Ethics related tags:** Moral fibre/ clothing with a conscience

Case studies of selected companies that pitch eco-friendly product attributes or brand associations are given below.

[51] Data from primary market research
[52] Data from primary market research

Case 1: Mother Earth[53]

"Mother Earth (earlier known as Industree] is a design-led craft- based company working very closely with large base of rural artisans and designers. They established the Industree Crafts Foundation, in order to support artisan skill and enterprise development in rural areas.

Mother Earths' mission is to offer the consumers the best of Indian natural hand crafted products while simultaneously providing livelihoods to the disenfranchised rural artisans and labour. A large part of its merchandise is sourced from rural producers, fair trade partners, NGOs and cooperatives.

Mother Earth's eclectic range of products includes organic and natural foods, home and personal care, gifts, home decor and apparel. These are all sold under sub-brands of Earth Home, Earth Food and Earth Fashion. All products available carry forward the ethos of the store; products sourced and developed are natural, healthy and cost-effective and provide opportunities to the rural community."

Case 2: Zeme Organics [54]

"We offer organic clothing for men, women, infants and maternity. Each design has been pored over, persevered through and perfected. Our clothes are a 100% certified organic, and we use only biodegradable, EZO free dyes which are good for the planet and good for you. Our product is made in India by companies who have Control Union (SKAL) certification and follow GOTS standard. Zeme Organics and its entire supply chain is certified for production and handling of organic products. We sell to retailers in India and abroad who are looking for quality organic clothes that offer great design and aesthetics at a reasonable price."

Zeme Organics' mission is " Offering and encouraging people to wear organic clothes is our way of contributing to help reduce ground water pollution and green house effect so that mother earth can breathe easily".

[53] "Mother Earth." Mother Earth. 2009 <www.Mothereatth.co.in>.
[54] "About Us." Zeme.2010 <http://www.zemeorganics.com/about_us>..

Case 3: Vanya Silks, Central Silk Board, GoI [55]

"There's Something Special About 'Vanya' Silks...

- Vanya Silks come mostly in natural colours – creams, beiges, browns, and also gold. They are in fact, the no-need-to-dye-silks, or dye-if-you-insist silks!
- These silks are user friendly and healthy because of their porous texture and thermal properties.
- All production processes are eco-friendly and do not at any stage produce chemical effluents.
- Tending to their production is a women-friendly activity. All activities from cocooning to marketing are carried out mostly by women.
- Tribal communities and economically disadvantaged sections of the society are the primary rearers of these silkworms.
- Conservation of nature grown food-plants of these silkworms by rearers offers protection to the forest wealth
- These silks enjoy a *niche* market the world over and have high potential for further development."

Case 4: Aura[56]

US Patent Certificate
Click to View

"To expand our business venture around an innovative process of producing herbal textiles and dyes. Thus help in preventing global warming and pollution related to textiles.

At Aura, our only dream is to offer options to each and every user to choose an herbal dyed textile over chemical dyed one, with no limitations to design, quantity, and quality. Aura Herbal Textiles Ltd is exclusively engaged in Herbal and Organic textiles ONLY certified by Global Organic Textile Standard (GOTS) Herbal and Natural Dyeing, weaving, printing all is done under keen supervision to maintain international quality standards.

Dyeing of fabrics up to 120' width has been achieved. Even lengths of up to 1000 meters in different fabrics like voiles, poplins, twills, flannels, corduroys, denims, knits, silks is now achieved at Aura. Aura Herbal Wear has beautiful colour palette of earthy shades & various prints ensuring no waste is generated. All the solid and liquid waste is used as manure & irrigating their Farms."

Eco-friendly products are no longer in the domain of the rich, the middle class (mostly young), who are becoming more conscious and aware, are now buying too.

[55] "The Wonders of India's Vanya Silks..." Vanya Silk. 2009 <http://indiansilk.kar.nic.in/vanya.htm>.
[56] "Aura: E-Catalogue." fibre2fashion. 2009 <http://www.fibre2fashion.com/auraherbalwear/>

Case 5: Red Oranges: the Organic Fashion and Lifestyle Store[57]

"Red Oranges mixes sustainability with style and comfort. This piece of clothing is made from the finest Organic Cotton grown without pesticides, GMOs and chemical fertilisers. It has been low impact dyed and bio-washed for a superior hand feel and softness. By purchasing this garment you support the movement for a greener planet."

Case 6: Moralfibre

MORALFIBRE
energised by hands

"Moralfibre is crisp and fresh, fabric, furnishing and ready to wear clothing range for health. Each piece of fabric is richly textured, made by hand-spun, hand-woven technique. We produce cotton, silk, wool and blends of highest specifications. Some of our fabrics are made with organic cotton. The quality of this cotton fabric guarantees a nice freshness in summer and veil of warmth for the colder season. Moralfibre products are energized by hands.

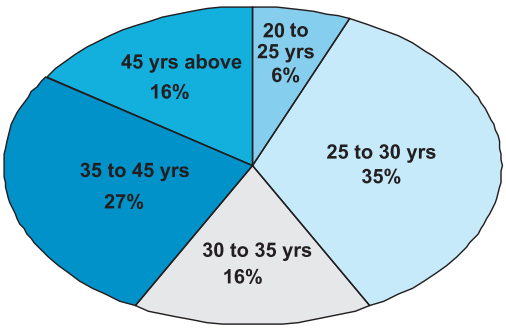
In each thread there is life, sunlight, water and earth. The threads are worked several times by hands by different artisans. The mere act of spinning and weaving by hands may create an inner peace; transmitted by the threads, it fills the fabrics with living energy. MORALFIBRE products are not only 'organic'- they are alive.

Moralfibre brand stands for Clothing with a Conscience. By using human energies, it has less negative impact on the environment. Eco-friendly and socio–economically sustainable, MORALFIBRE provides work in a fair way to thousands of skilled and unskilled people. Today when the concern about Global Warming and Climate Change are growing... MORALFIBRE is a unique way of fabric making, clean energy initiative aiming to have far reaching economic and social benefits. A purchase of MORALFIBRE is a step towards creating a 'Carbon Neutral' and 'Zero Poverty World'. Moralfibre frees the environment from pollution and depletion and frees people from poverty."

Who Buys Eco-Friendly Products (according to market players)

Eco-friendly products are no longer in the domain of the rich, the middle class (mostly young), who are becoming more conscious and aware, are now buying too.

Chart 1: Age group of customers



Individuals: Individual buyers form the largest segment of their consumer base in comparison to the institutional buyers. The majority of the customers in this group are in the age group of 25 to 45 years (Refer chart1). Market players of the eco-friendly products informed that women (as high as 85%) are the actual buyers of the eco-friendly products. Amongst the end-users, working professionals and young adults formed the largest chunk.

[57] Product tag of one of the products of Red Oranges, a Kolkata based company dealing in eco-friendly textiles

Institutional buyers: Amongst the institutional buyers, hotel and restaurants formed a major chunk, followed by corporations and educational institutions. It is noteworthy that call centres emerged as a separate category altogether.

Why Customers Buy Eco-Friendly Products

The majority of the players felt that the customers were buying their products due to their awareness levels as well as due to the "feel good factor." Some minor factors mentioned were "expensive," "interested"' and "style statement."

Most retailers felt the majority of customers bought eco-friendly products in an experimental mode. While the more established retailers felt their customers purchased such products because of their quality and that a large segment of their customers are repeat customers.

Manufacturers and Suppliers

As illustrated in Table 6 above, more than 60% of the eco-friendly retailers are engaged in manufacturing and supplying. There are hardly any market players (except big retailers like Shoppers' Stop and Lifestyle) who are just retailing and are not involved in manufacturing and supply of eco-friendly products.

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In terms of manufacturing and supply, the following categories emerged:

- **Producer/artisan groups or cooperatives supported by civil society organisations:** In this category, there are organisations like Mother Earth, which has collaborated with producer groups and organisations from all over the country for their supplies. Some other significant ones include Sadhna, People tree, Ants, Sasha and Sahaj, Fabindia, Dastakaari Haat Samiti, and Alok Industries
- **Own production:** Very large retailers and designers had their own manufacturing facilities. Some notable ones in this category are Raymonds, Maspar and F & F
- **Small manufacturer and suppliers:** Zeme and Sarga are recent start ups
- **Large manufacturer or supplier:** Very few large players exclusively manufacture and supply eco-friendly products to large retailers like Shoppers Stop and Lifestyle. The only exception is in the category of 'Bags'. One such significant supplier of the eco-friendly bags is www.2earth.com.

Case study 7: 2earth.com (www.2earth.com)

A large manufacturer & supplier of Eco-friendly Bags who are not into retailing

- Manufactures products that are environment friendly
- Uses biodegradable inputs to produce commonly used products
- Avoids plastic & other harmful toxic materials
- Takes responsibility in educating as well as practicing all means of conserving the environment
- Maintains the highest quality standards
- Its clients span across the globe with Japan & America being the biggest buyers
- Prices that are affordable

Product Range

- Biodegradable laundry products – suit covers, garment covers, shirt bags, laundry delivery and collection bags, valet bags, bin liners, newspaper bags, chef caps, shoe bags, etc.

- Natural jute products - carry bags, newspaper bags, shopping bags, drawstring bags for shoes, portfolios and folders
- Natural cotton products - laundry bags with drawstrings for closing, carry bags, newspaper bags, toiletry bags, etc.

Client Profile

Corporate Organizations:
Hotel Establishments; Retail (Shoppers' Stop - all India, Pantaloon Depot - all India, The Bombay Stores - all India, Tresorie Mumbai, The Center for Arts & Crafts Mumbai); Countries they export to: Mauritius, established suppliers to hotel group in the United States and the United Kingdom

Ease of Sourcing Eco-Friendly Products

Most of the retailers and suppliers mentioned that it is not easy to source eco-friendly products, especially because the size of the industry in the country is very small. Zeme, a recent start up is trying to make inroads in the domestic organic cotton market. Zeme takes supplies of organic cotton fabric from exporters. Zeme mentioned that as the domestic demand for organic cotton is very low, procuring in small quantities is a problem, as the exporters in the segment do not like to supply in low volumes.

Other businesses mentioned that due to the decentralised nature of the supply chain, it is difficult to maintain efficiency, which is the main reason that so many retailers have their own manufacturing facilities and vice-versa. This indicates the value chain of the eco-friendly products is yet to mature and has a relatively low number of scattered independent units developing supply sources and retail respectively.

Pricing strategy

Most retailers mentioned that they charge premium for these products in the range of 10 to 30%. They noted consumers do not accept any premium beyond this. Some retailers and manufacturers who are new to the business of eco-friendly products mentioned that their premium/ margins are not any different from other retailers. Some retailers opined that due to the low sales volume it is difficult to recover costs at this stage.

Interest Among Retailers

Most retailers stated there is demand among existing customers for the eco-friendly products and they would be interested in adding to their product range. However, product quality has to be ensured, because eco-friendliness is an additional attribute at the point of purchase and the average customer takes a decision on that basis.

4.3 Consumers' Perspective

The Research Team conducted an online and direct consumer survey in one Fabindia store in New Delhi. The survey results highlighted the Indian consumers' profile and preferences for eco-friendly textile products.

Consumer Profiles and Preferences

Respondents' Profile

The random sample was composed of two segments. One hundred and seventy-five people participated in the internet-based survey. Sixty people who visited the FabIndia store in Vasant Kunj, New Delhi were interviewed.

Most of the retailers and suppliers mentioned that it is not easy to source eco-friendly products, especially because the size of the industry in the country is very small.

Most retailers mentioned that they charge premium for these products in the range of 10 to 30%. They noted consumers do not accept any premium beyond this.

Table 10: Respondents Age of Respondents (in Sample)[58]

Age Group	Respondents			Percentage of Respondents		
	All	Internet Survey	FabIndia	All	Web	FabIndia
Less than 20	9	1	8	4%	1%	13%
20-30	102	75	27	43%	43%	45%
30-40	85	76	9	36%	43%	15%
40-50	25	14	11	11%	8%	18%
50-60	10	5	5	4%	3%	8%
Older than 60	4	4	0	2%	2%	0%
Total	235	175	60	100	100	100

Thirteen percent of the respondents were below the age of 20, which in many ways is contrary to the popularly held view that the youth are not keen on the look and feel of a typical eco-friendly product. This could be due to improved production processes and designs as well as the growing level of awareness among the youth regarding eco-friendly products.

Forty-five percent of the respondents were in the age category of 20-30, which is when most people have begun working, but tend to have fewer responsibilities, giving them larger disposable incomes. That this segment is choosing to frequent a store like FabIndia is a positive sign.

Table 11: Respondents' Sex[59]

Category	Respondents			Percentage of Respondents		
	All	Internet Survey	FabIndia	All	Web	FabIndia
Male	102	95	7	43%	54%	12%
Female	133	80	53	57%	46%	88%
Total	235	175	60	100	100	100

The fairly even distribution of male and female respondents among the internet survey appears to indicate that both sexes have an interest in the issue of eco-friendliness. This issue must be taken note of by the producers of eco-friendly products since the market offers limited eco-friendly products for men.

However, the FabIndia respondents were heavily skewed in favour of females, indicating that the purchasing of eco-friendly and related products appears to mainly be done by the women. While this may be true for other categories of products too, this data is an important indicator not only for product development but also for promotion.

[58] Data from primary market research
[59] Data from primary market research

Table 12: Respondents' Occupation[60]

Category	Respondents			Percentage of Respondents		
	All	Internet Survey	FabIndia	All	Web	FabIndia
Private Company	108	94	14	46%	54%	23%
Government/PSU	16	10	6	7%	6%	10%
Self-Employed Professional	29	21	8	12%	12%	13%
Entrepreneur	13	10	3	6%	6%	5%
Student	25	8	17	11%	5%	28%
Housewife	13	4	9	6%	2%	15%
Retired	5	5	0	2%	3%	0%
Any other	0	0	0	0%	0%	0%
NGO	20	19	1	9%	11%	2%
Education	5	3	2	2%	2%	3%
Research	1	1	0	0%	1%	0%

The distribution across categories was fairly spread out. However, among the students who form 11% of total number of respondents none participated in the internet survey.

Table 13: Family Income[61]

Income Category	Respondents			Percentage of Respondents		
	All	Internet Survey	FabIndia	All	Web	FabIndia
Less than Rs. 4 Lakhs/annum	48	42	6	20%	24%	10%
Rs. 4 - 8 Lakhs/	61	51	10	26%	29%	17%
annum						
Rs. 8 - 12 Lakhs/annum	54	34	20	23%	19%	33%
More than Rs. 12 Lakhs/annum	72	48	24	31%	27%	40%

The distribution of respondents is even across all categories. However, FabIndia respondents are clearly from the more affluent categories as indicated in the percentage of respondents in the higher income categories.

Current Spending on Textile Products

The spending range of respondents' families on textile products broadly fell into four categories. Respondents were asked not only about eco-friendly products, but also regarding any other "eco-friendly" products.

Table 14: Garments Annual Expenditure vs. Family Income All[62]

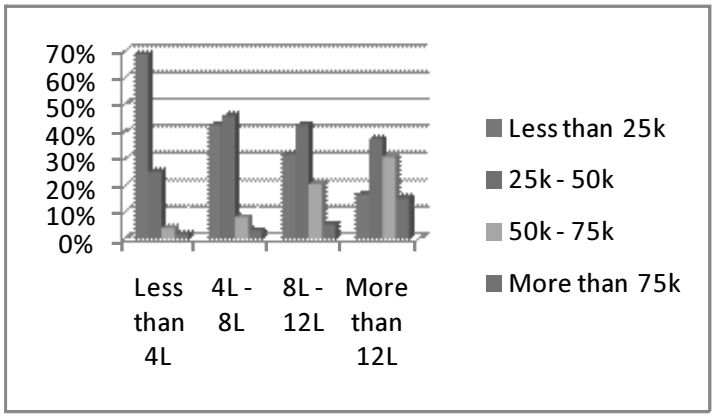
Range in Rs.Income category	Less than 25k	25k - 50k	50k - 75k	More than 75k
Less than 4Lakhs	69%	25%	4%	2%
4Lakhs - 8Lakhs	43%	46%	8%	3%
8Lakhs - 12Lakhs	31%	43%	20%	6%
More than 12Lakhs	17%	38%	31%	15%

[60] Data from primary market research
[61] Data from primary market research
[62] Data from primary market research

- **Garments**

There appears to be a direct correlation between income categories and garments expenditure as families with higher incomes appear more willing to spend on garments. As the graph shows, the income category of less than Rs. 4 lakhs is heavily skewed in favour of the lowest spending range whereas the income category of Rs. 12 lakhs and above is very evenly spread out. As is evident from the table, sensitivity to price reduces with increasing incomes and vice versa.

Chart2: Annual Income Vs Expenditure on Garments[63]



Personal Accessories

The spending data regarding personal accessories, including bags, belts and shoes is very similar to that of garments. The higher the income, the greater is the tendency to spend more on personal accessories. However, it should be noted that the percentage of respondents across income categories is lower for the top two spending categories than what they were for garments.

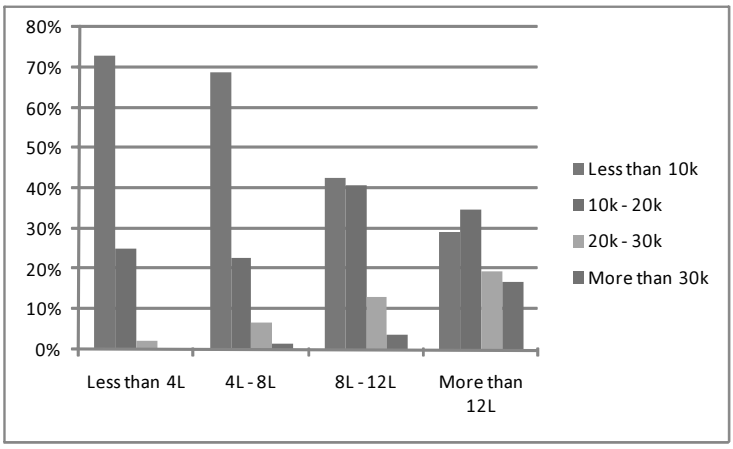
This indicates that sensitivity towards pricing/spending is higher for accessories as compared to garments. It also shows a higher priced garments may be more easily accepted by the customer than a similar increase in accessories.

Table 15: Accessories Annual Expenditure vs. Annual Family Income All[64]

Range in Rs. Income category	Less than 10000	10000 - 20000	20000 - 30000	More than 30000
Less than 4Lakhs	73%	25%	2%	0%
4Lakhs – 8Lakhs	69%	23%	7%	2%
8Lakhs - 12Lakhs	43%	41%	13%	4%
More than 12Lakhs	29%	35%	19%	17%

[63] Data from primary market research
[64] Data from primary market research

Chart 3: Accessories Annual Expenditure vs. Annual Family Income[65]



Bed Linen

As in the case of personal accessories, the data on spending on bed linens shows a marked preference for the two lower-spending categories. The price sensitivity is more pronounced in the case of bed linens than in personal accessories.

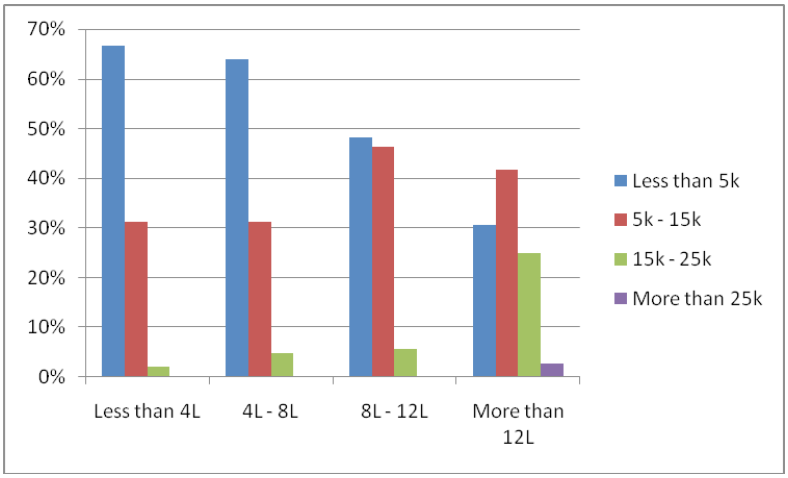
The price sensitivity is more pronounced in the case of bed linens than in personal accessories.

In some ways, this data brings to light the point that if the lower income segments are to be targeted, the pricing has to be very competitive; else, the producer will have to convince the customer that the product has value beyond mere utility when compared to other similar products available in the market.

Table 16: Bed Linen Annual Expenditure vs. Family Income All[66]

Range in Rs.	Less than 5000	5000- 15000	15000 – 25000	More than 25000
Less than 4 Lakhs	67%	31%	2%	0%
4 L – 8 Lakhs	64%	31%	5%	0%
8 L – 12 Lakhs	48%	46%	6%	0%
More than 12 Lakhs	31%	42%	25%	3%

Chart 4: Bed Linen Annual Expenditure vs. Family Income All[67]



[65] Data from primary market research
[66] Data from primary market research
[67] Data from primary market research

Home Furnishings

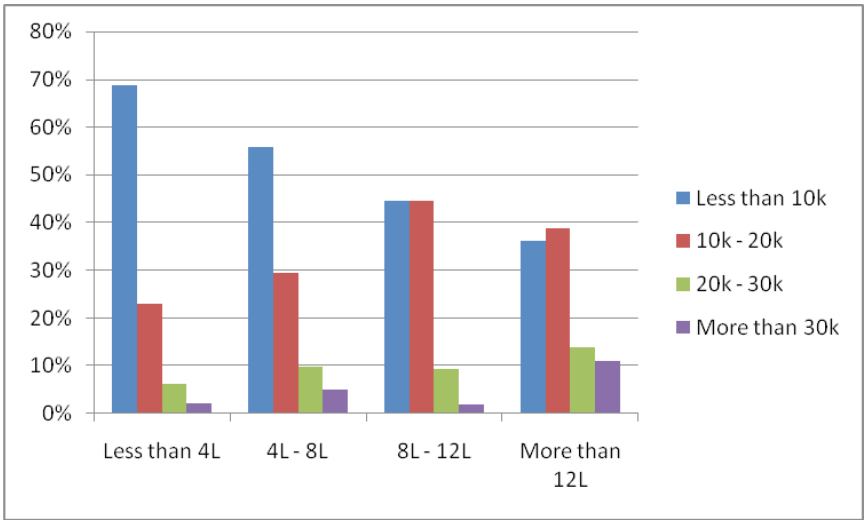
The data on home furnishings is very similar to bed linen, wherein the expenditure increases with the higher incomes. Only 75% of the respondents with incomes over Rs. 12 Lakhs spent less than Rs. 20,000 on home furnishings.

Table 17: Home Furnishing Annual Expenditure Vs. Family Income All[68]

Range in Rs.	Less than 10000	10000 - 20000	20000 - 30000	More than 30000
Less than 4 Lakhs	69%	23%	6%	2%
4 Lakhs – 8 Lakhs	56%	30%	10%	5%
8 Lakhs – 12 Lakhs	44%	44%	9%	2%
More than 12 Lakhs	36%	39%	14%	11%

Non-polluting production process, products using natural raw material and organic products seem to embody the predominant association that customers have with eco-friendliness. Any product or an organization that can claim one or more of these attributes is perceived as an eco-friendly product by consumers.

Chart 5: Home Furnishing Annual Expenditure Vs. Family Income All[69]



Understanding of Eco-Friendliness

Non-polluting production process, products using natural raw material and organic products seem to embody the predominant association that customers have with eco-friendliness. Any product or an organization that can claim one or more of these attributes is perceived as an eco-friendly product by consumers.

A large number of respondents considered products with recyclable packing as eco-friendly. This may be because the predominant packaging material is plastic, which is widely understood to not be eco-friendly.

When comparing the data from the internet survey and the in-store interview, the differences between perceptions on cottage industry products can be easily seen. A large number of FabIndia respondents believed that a cottage industry product may be more eco-friendly, the same pattern cannot be seen among the internet respondents. It is difficult to attribute a specific reason to this difference except the fact that FabIndia itself may be bracketed by the respondents under the cottage product category and hence their association of eco-friendliness with this term.

[68] Data from primary market research
[69] Data from primary market research

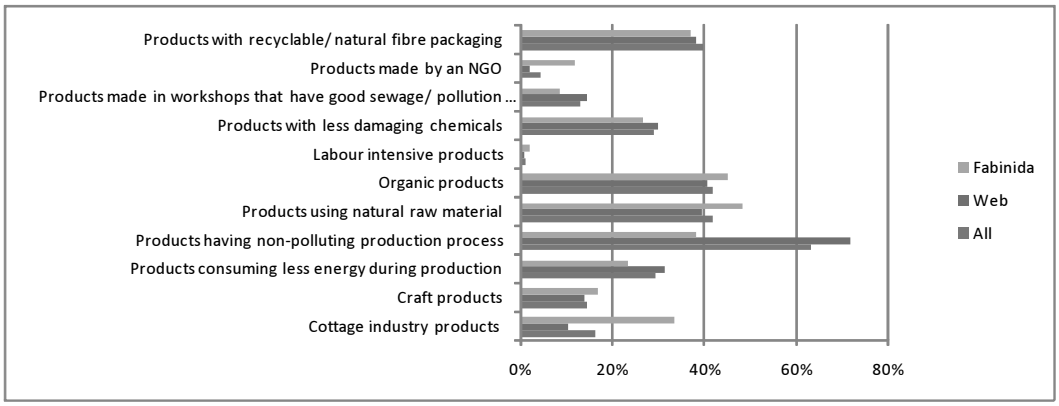
Products with less damaging chemicals and those consuming less energy also had eco-friendly connotations for respondents.

Table 18: Understanding of Eco-Friendliness[70]

Indicators	Percentage of Respondents		
	All	Internet Survey	FabIndia
Cottage industry products	16%	10%	33%
Craft products	14%	14%	17%
Products consuming less energy during production	29%	31%	23%
Products having non-polluting production process	63%	72%	38%
Products using natural raw material	42%	39%	48%
Organic products	42%	41%	45%
Labour intensive products	1%	1%	2%
Products with less damaging chemicals	29%	30%	27%
Products made in workshops that have good sewage/ pollution treatment	13%	14%	8%
Products made by an NGO	4%	2%	12%
Products with recyclable/natural fibre packaging	40%	38%	37%

Most respondents believed they were buying at least some eco-friendly products, indicating that the eco-friendly concept has some space in the consciousness of a potential customer.

Chart 6: Understanding of Eco-Friendliness[71]



Purchase of Eco-Friendly Products

Most respondents believed they were buying at least some eco-friendly products, indicating that the eco-friendly concept has some space in the consciousness of a potential customer. Such consciousness seemed to be slightly higher in the FabIndia respondents, which can be expected since FabIndia's pitch of 'handcrafted products' does carry an eco-friendly connotation.

[70] Data from primary market research
[71] Data from primary market research

In addition, the data showed a fair degree of awareness on the concept of "total eco-friendliness." Respondents seemed to understand it is a complex output to achieve, because of which 29% opted for "can't say."

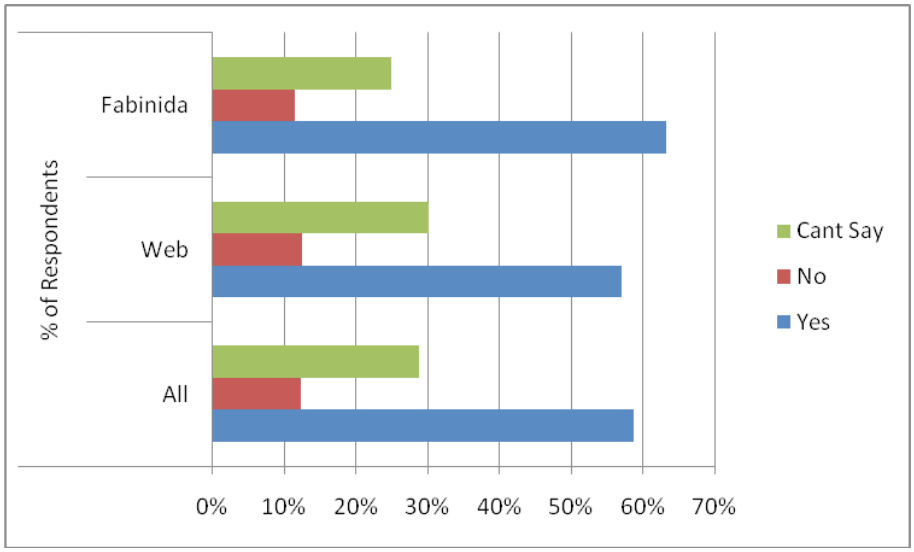
Twenty-five percent, of the FabIndia respondents answered "can't say," which may also indicate an apathy towards the eco-friendly concept or that it does not matter whether the product is eco-friendly or not.

Table 19: Do You buy Eco-Friendly Products[72]

Responses	% of Respondents		
	All	Web	FabIndia
Yes	59%	57%	63%
No	12%	13%	12%
Can't Say	29%	30%	25%

The respondents believed they purchase 29 different eco-friendly products, including textiles, energy efficient electrical appliances, cosmetics, recycled paper, and earthen utensils. The maximum number of products purchased by respondents are listed in Table 20 and chart 8.

Chart 7: Percentage of respondents who buy Eco-friendly products[73]



Eco-Friendly Products

The respondents believed they purchase 29 different eco-friendly products, including textiles, energy efficient electrical appliances, cosmetics, recycled paper, and earthen utensils. The maximum number of products purchased by respondents are listed in Table 20 and chart 8.

There were variations across income categories. In garments, there was a dip between the second and first categories, which is contrary to the commonly held perception that affluence leads to purchasing more eco-friendly products.

Organic food on the other hand follows a predictable pattern where there are no respondents from the fourth category while a significant number of respondents from the first category have said that they buy such products. The difference in the pattern of

[72] Data from primary market research
[73] Data from primary market research

these products is likely to lie in the marketing mix that has been followed for both products. Organic food has been always treated as a separate product segment for which a significantly higher price is charged highlighting the human and environmental benefits of the products.

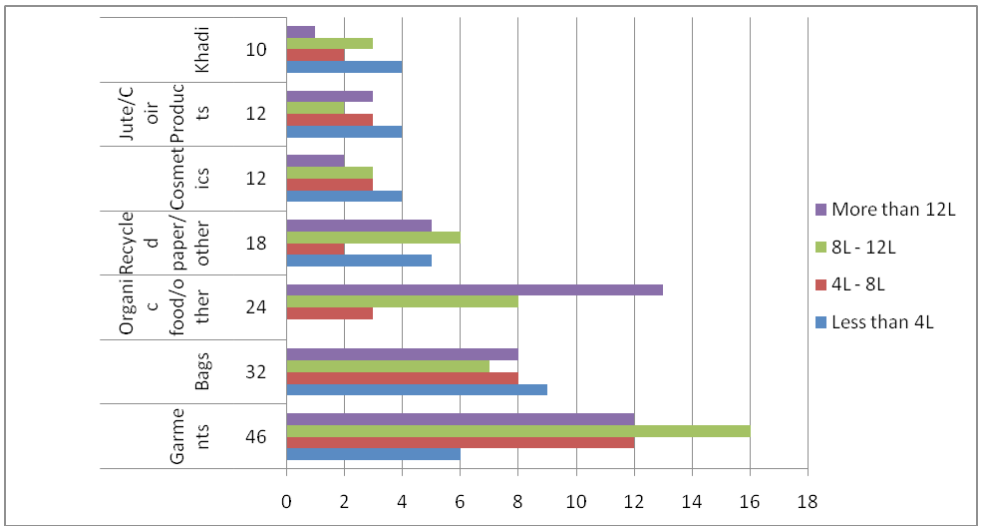
Garments that fall under the eco-friendly spectrum, on the other hand, have not been marketed as eco-friendly but as traditional and comfortable products and no discernable premium has been charged for these attributes. As a result, garments are more widely accepted than organic food products.

Jute/coir products clearly have an association with eco-friendliness, again because several products in these materials can substitute plastic products (which people know are not biodegradable). There were also respondents who associated *khadi* with eco-friendliness. This segment theoretically should have been higher given *khadi's* real eco-friendly nature.

Table 20: Which Eco-Friendly Products Do you Buy? - Top 7[74]

Products	Grand Total	Income Categories			
		Less than 4Lakhs	4Lakhs - 8Lakhs	8Lakhs - 12Lakhs	More than 12Lakhs
Garments	46	6	12	16	12
Bags	32	9	8	7	8
Organic food/other	24	0	3	8	13
Recycled paper/other	18	5	2	6	5
Cosmetics	12	4	3	3	2
Jute/Coir Products	12	4	3	2	3
Khadi	10	4	2	3	1

Chart 8 (the above chart): Eco-friendly products being purchased by Respondents[75]



[74] Data from primary market research
[75] Data from primary market research

Constraints to Buying Eco-Friendly Products

Non-availability and high prices are two of the most frequently cited reasons among consumers for not buying eco-friendly products. This is followed by poor awareness. Some respondents raised questions about the actual benefits that accrue from using eco-friendly products while other raised a question mark on the reliability of products claiming to be eco-friendly.

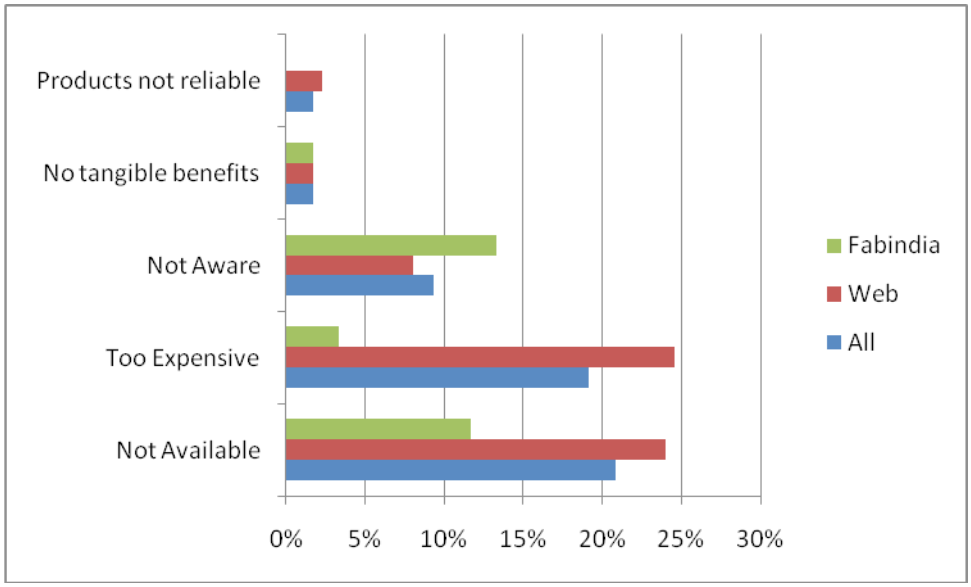
On the other hand, the FabIndia respondents, who belong to the segment that purchases eco-friendly and related products, did not feel that the products were too expensive or that they were not adequately available.

Non-availability and high prices are two of the most frequently cited reasons among consumers for not buying eco-friendly products. This is followed by poor awareness.

Table 21: Why You Don't Buy Eco-Friendly Products?[76]

Reasons	All	Internet Survey	FabIndia
Not Available	21%	24%	12%
Too Expensive	19%	25%	3%
Not Aware	9%	8%	13%
No tangible benefits	2%	2%	2%
Products not reliable	2%	2%	0%
Not identifiable	1%	1%	0%
Difficult to maintain	1%	0%	3%
Limited Products	0%	1%	0%
Few Outlets	0%	1%	0%
Not much information	0%	1%	0%
Rarely buy textile products	0%	0%	2%

Chart 9: Reasons for not buying eco-friendly products[77]



[76] Data from primary market research
[77] Data from primary market research

Basis of Deciding Eco-Friendliness of Products

The data showed that having an eco-label was clearly the most important way for respondents to decide on the eco-friendliness of a product. Respondents who indicated Craftmark to be an important basis may also be added to this category of people who are looking for assurance of authenticity of the claim.

Packaging, branding and assurance that the item was procured from an artisan were some of the other reasons cited as ways to make the customers feel that the product is truly eco-friendly.

The FabIndia respondents had a clear preference for brands that ostensibly represent eco-friendly products.

Another contributing factor mentioned by respondents were the physical attributes of the product like fabric quality, prints and colours. This indicates that apart from assurances of eco-friendliness and the packaging, the product needs to have a certain look and feel for customers to perceive it as eco-friendly.

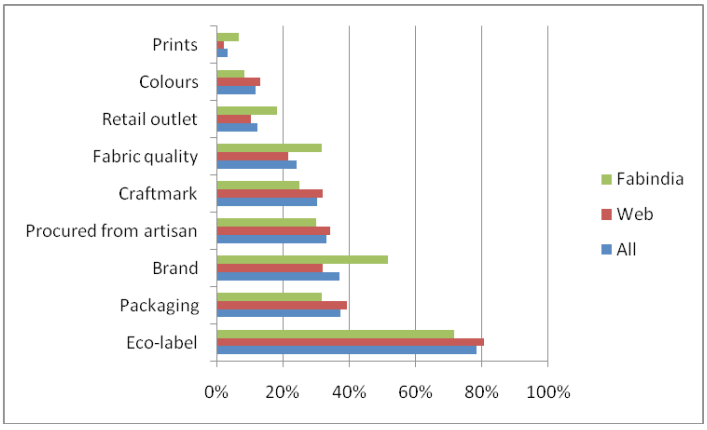
The data showed that having an eco-label was clearly the most important way for respondents to decide on the eco-friendliness of a product.

Packaging, branding and assurance that the item was procured from an artisan were some of the other reasons cited as ways to make the customers feel that the product is truly eco-friendly.

Table 22: Basis of Deciding Eco-Friendliness of Product[78]

Basis	All	Internet Survey	FabIndia
Eco-label	78%	81%	72%
Packaging	37%	39%	32%
Brand	37%	32%	52%
Procured from artisan	33%	34%	30%
Craftmark	30%	32%	25%
Fabric quality	24%	22%	32%
Retail outlet	12%	10%	18%
Colours	12%	13%	8%
Prints	3%	2%	7%
Advertisement	1%	1%	0%
Handmade	0%	1%	0%
Ratification by Government	0%	1%	0%
Visual Assessment	0%	1%	0%

Chart 10: Basis on which consumers decide eco-friendliness[79]



[78] Data from primary market research
[79] Data from primary market research

Eco-Friendly Products for Future

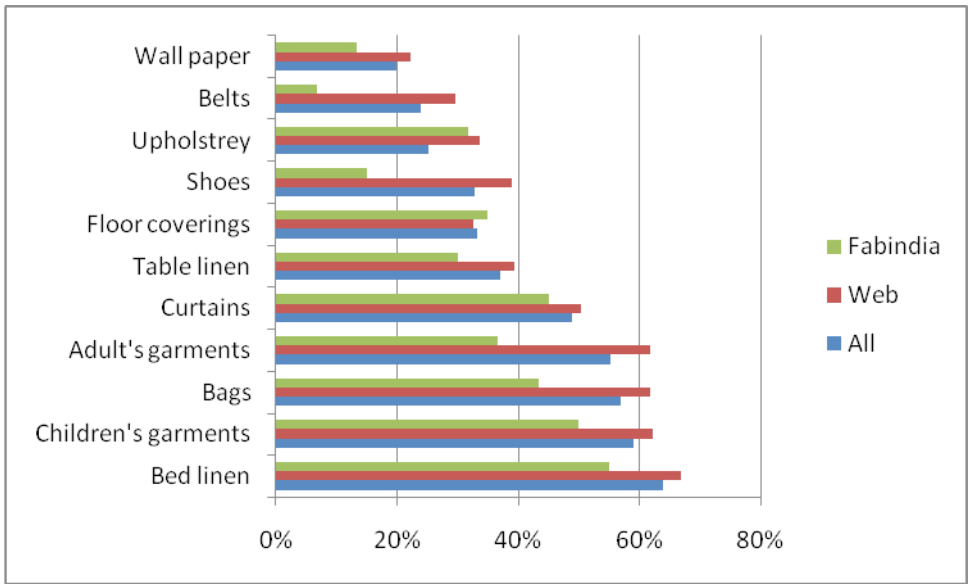
The responses showed a clear preference for garments (adult and children as well as bed linen). This demonstrates that the "contact theory" is applicable here. The contact theory states that the closer the contact with the self, the more sensitive one is towards the eco-friendliness of the product.

The only exception to this theory is bags, the demand for which, as mentioned earlier, is a counter-response to plastic. This trend has been achieved after many years of propaganda and publicity about the ills of plastic.

Table 23: Which Products Should be Eco-Friendly?[80]

Products	All	Internet Survey	FabIndia
Bed linen	64%	67%	55%
Children's garments	59%	62%	50%
Bags	57%	62%	43%
Adult's garments	55%	62%	37%
Curtains	49%	50%	45%
Table linen	37%	39%	30%
Floor coverings	33%	33%	35%
Shoes	33%	39%	15%
Upholstrey	25%	34%	32%
Belts	24%	30%	7%
Wall paper	20%	22%	13%

Chart 11: Products which should necessarily be eco-friendly[81]



[80] Data from primary market research
[81] Data from primary market research

Premium Price for Eco-Friendly Products

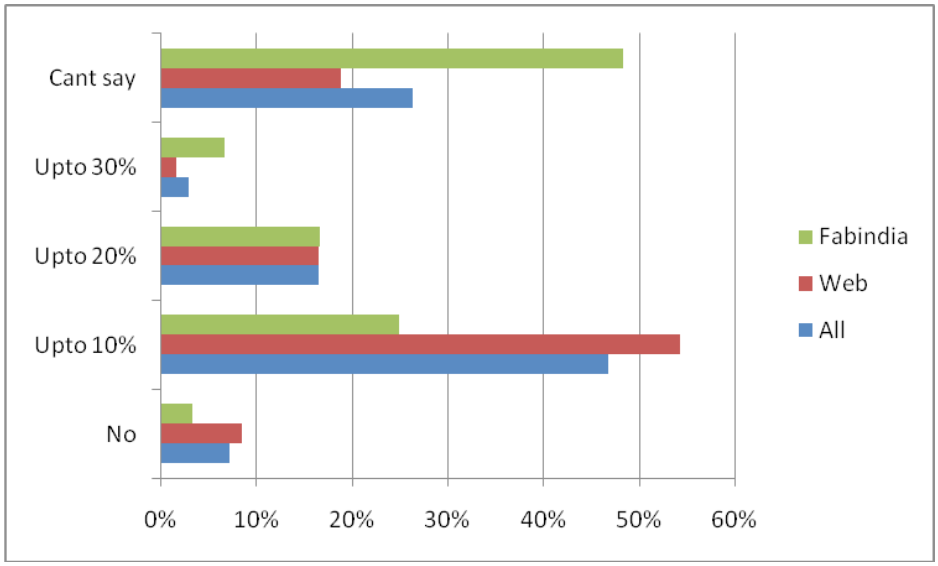
The majority of respondents are wary of paying any or a very little premium even when they received watertight assurances about eco-friendliness of a product. In many ways, this represents the general faithlessness that prevails in the society where everyone expects that any new claim is just another excuse to charge higher prices without giving adequate additional returns.

This also represents the fact that eco-friendly products, unlike organic foods, have not been promoted systematically in the domestic market.

Table 24: Will You Pay a Premium if the Eco-Friendliness of Product is Assured?[82]

Particulars	All	Internet Survey	FabIndia
No	7%	9%	3%
Up to 10%	47%	54%	25%
Up to 20%	17%	17%	17%
Up to 30%	3%	2%	7%
Cant say	26%	19%	48%

Chart12: Willingness to pay premiums for eco-friendly products[83]



The majority of respondents are wary of paying any or a very little premium even when they received watertight assurances about eco-friendliness of a product

4.4 Eco-Friendly Textiles in Indian Fashion Industry

The introduction of various high-end 'eco-friendly' labels and designer collections in recent years indicates that the Indian fashion industry appears to be responding to the growing number of eco-aware consumers. Designers and stores showcasing these new product ranges are not looking for eco-certification as of now and are instead relying on marketing and promotional material, and the "look" of the product to vouch for the "green-ness" of the product.

[82] Data from primary market research
[83] Data from primary market research

Designer Eco-Friendly Collections

Anita Dongre recently launched "Grassroot", a contemporary western wear collection at Wills India Fashion Week, with the claim that Grassroot was a "complete label that only uses environment friendly fabrics and environment friendly techniques. "So, be it the raw material, dyeing, finishing techniques, everything is complete environment friendly. Colours used were vegetable dyes," said Anita.[84]

South Mumbai-based fashion designer and personal stylist Sonia Mehra, who recently unveiled her organic range of outfits, explains the growing demand, "More and more people are opting for organic fabric, besides being eco-friendly, it is more soft and comfortable. And, unlike the past, now eco-friendly clothes come in contemporary and modern designs and that too at an affordable price."[85]

Likewise in Kolkata, designer Arpita Kalra's new eco-friendly clothing line Full Cupboard is being retailed at Seesha, one of the city's popular fashion houses, this year. Kalra said: "The clothes have been conceived by using bio-degradable natural fabrics, using recycled embroidered silk and cotton. 'The clothes have been conjured up by using old Pakistani embroidered stuff that had been given away. Not only are the crushed clothes eco-friendly but they are also easy to maintain and need no ironing. They can be just rolled up and forgotten.''

With the price tag ranging from Rs. 5,000 to Rs. 20,000, the collection is available in vibrant colours with heavy embellishments keeping in mind that the launch of the collection coincides with Durga Pooja. A recent fashion show in Kolkata also showcased only pristine cotton creations - a strong endorsement of the natural fabric as a style statement. The show, which had leading models Tapur and Tupur Chatterjee sporting Mona-Pali and Kiran Uttam Ghosh collections, was organised to emphasise that cotton is anything but 'uncool'.[86]

Designer Sabyasachi Mukherjee has been extensively using *khadi* in his collections ever since his debut in 2002. However, to him, using local, hand-woven fabrics is the only way to distinguish Indian textile products and handle the invasion of global brands. By dressing up Bollywood stars Aishwarya for Mani Ratnam's *Ravana* and Sanjay Leela Bhansali's *Guzaarish*, and Vidya Balan for R. Balki's *Paa*, all in *khadi*, he is trying to change both *khadi's* aspirational value and Bollywood's stereotypical obsession with "bling" and polyester.

He also launched a *khadi* bridal collection, a complete anomaly in the heavily embroidered bridal-wear product segment. However, each and every piece of the 90-odd *lehengas*

[84] "Designer Dongre Launches India's First Ever-Organic Clothing Line." South Asian Women's Forum 10 September 2007 <http://www.sawf.org/newedit/edit09102007/news.asp>.
[85] Gupta, Preeti. "Fashion Goes Eco-Friendly." The Times of South Mumbai 2 May 2008 <http://www.mumbaipluses.com/downtownplus/index.aspx?page=article&sectid=10&contentid=20080502200805021555225 15d723a8&sectxslt=&comments=true>.
[86] Bose, Debayoni. "Eco-Friendly Attire is in Thing in Kolkata." 10 October 2007. Earthtimes <http://www.earthtimes.org/articles/show/121621.html>.

in Sabyasachi's collection sold out making it his best-selling series till date. The designers feels that he knows his customers are rich women who own everything. What they need is a point of view. Khadi gives them that."[87] Despite his consistently high sales volumes and the critical acclaim he has received, he has attracted criticism as well for the high price range of the products.. Sabyasachi collections of *khadi*, cotton saris and dresses start at 6,500 rupees (£80) and rise to 100,000 rupees (£1,230) for bridal and special wear.[88]

Other designers are doing similar work as well. Promoting organic cotton in a big way, men's wear designer Digvijay Singh created an interesting and very practical line for the label Bhusattva. Working with eco friendly fabric and natural herbal dyes, the men's wear line had subtle touches of ethnicity with the look being very western.[89]

Fashion designer Rohit Bal uses linen extensively in his creations. "There's no limitation to *khadi*. It comes in such wonderful colours. Also, we are living in era that's not specifically defined - suddenly everything seems to be working - be it *kurtas* and jeans, or *salwar kameezes*, western dresses, party wear, the works... But what has gained popularity is Indian fashion abroad - the *kurtas, saris* - all of which provide scope to use *khadi*."[90]

4.5 Trend Analysis of the Products

Using the findings from the market survey and consumer survey, the Research Team did a trend analysis on sales frequency. The products have been divided into three categories (based on retailer's inputs) as presented in the Table 25:

- Fast Moving or upward: In this category, sales of the products are constantly increasing
- Stable/consistent performers: Sales of the products is healthy and consistent
- Slow moving: Sales of these products are picking up very slowly and retailers are wary of stocking them.

[87] Vasudev, Shefalee I. "Khadi's Refinement Lies In Its Humility." Outlook. 24 August 2009 <http://www.outlookindia.com/article.aspx?261316>.
[88] Luke, Catriona. "Indian Designer Champions Homespun." South Asian Mail. 20 October 2009. <http://www.southasiamail.com/news.php?id=44030>.
[89] "Digvijay Singh." Lakmé Fashion Week. March 2009. NewsVision. 2009 <http://newsvision.in/fashionweekreview/lakme_fashion_week_aw09_day1.html>.
[90] "Bollywood Designers Encourage the 'Khadi' Phenomenon." 1 October 2009. IndiaTime Movies. <http://movies.indiatimes.com/Features-Events/Features/Bollywood-designers-encourage-the-khadi-phenomenon/articleshow/5078416.cms>.

Table 25: Trend Analysis of the Eco-Friendly Products in the Market[91]

Category	Fast moving/upward	Stable/consistent performers	Slow moving
Furnishings	Sofa throws	Cushions	Soft furnishing
	Floor cushions and pillows	Pillows	Infant bedding
	Table cover	Table linen	Toddler bedding
	Hand napkins	Place mats	Children's bedding
		Runners	Quilts
		Cover sheets	Other home furnishing
		Bed linen	Bath towels
		Women's wear	Floor mats
			Flooring rugs
			Car seat covers
			Upholstery
			Curtains and curtain accessories
Garments	Women's wear	Women's wear	Men's Wear
	Children's wear	Sleepwear	Sportswear
			Fitness wear
			Swim wear
			Undergarments
			Bathrobes
			Socks and stockings
			Special purpose clothing
			Uniforms and work wears
			Wedding garments
			Woollens
Accessories	Bags	Shawls	Belts
	Stoles		Handkerchief
	Scarves		

Currently in the market, there are nine items in the three categories, which are fast moving and showing upward trends and ten consistent performers. The slow movers are the ones which have potential for the future and be developed as niche products by manufacturers.

According to the exporters surveyed, most of the listed products have received a very good response in Western markets and as the economy grows and eco-friendly market matures, these products are likely to find more takers.

[91] Data from primary market research

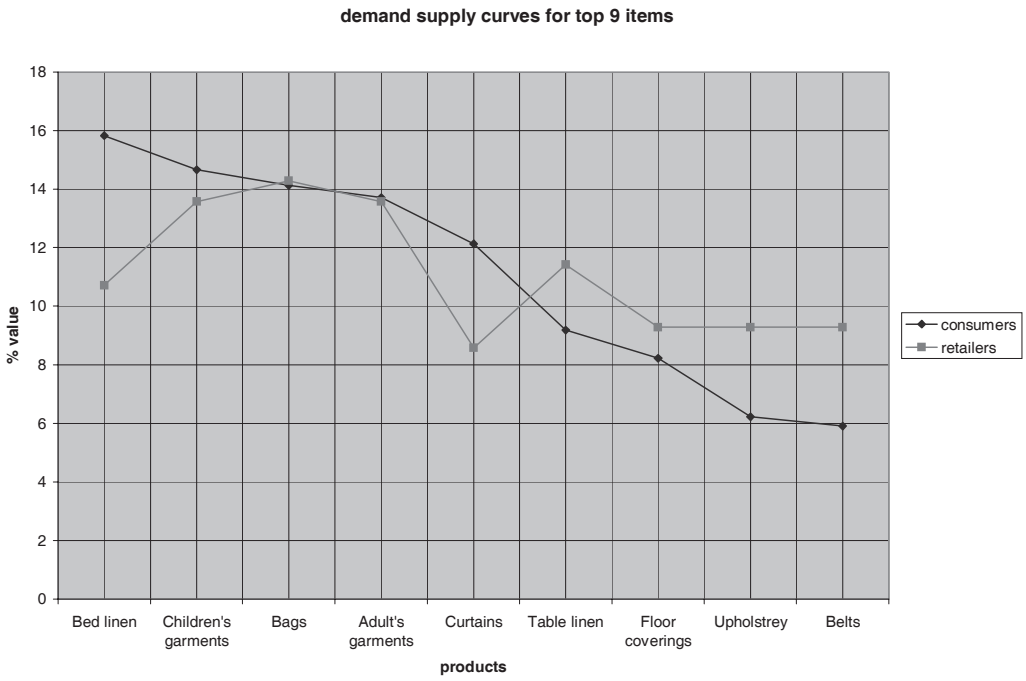
4.6 Demand and Supply Assessment

Based on the data collected from the market and consumers, the research team assessed the gap between demand and supply among the top nine items in the eco-friendly market.

There is a visible gap in the demand and supply of certain products like bed linen curtains, bags, and children's apparel.

The major findings are:

1. There is a visible gap between demand and supply for bed linen, curtains and children's apparel.
2. The market for belts, upholstery, floor coverings and table linen is good and these products are easily available.
3. Supply matches demand for bags and adult garments, which illustrates the potential for increasing the product range in this segment to provide better choices to the customers.[92]



[92] Data from primary market research

5. RECOMMENDATIONS

5.1 Market Related Recommendations

Opportunities

Fast Growing Retail Market

A fast growing retail market where people are willing to spend and experiment, offers a unique opportunity for marketing eco-friendly products.

At the macro level, there is a huge excitement in the market due to the recent retail boom. This has also attracted the attention of global players and now most can be found in tier two and tier three cities.

It is a historic moment for the retail industry with new shopping plazas and malls opening across the country. For example, in Bengaluru there are around 24 big malls/shopping plazas, 11 big superstores, 120 lifestyle stores selling well known brands, 30 high fashion stores, and 50 home décor/handicrafts stores (and these figures are conservative estimates).

A fast growing retail market where people are willing to spend and experiment, offers a unique opportunity for marketing eco-friendly products.

Expanding Textile and Clothing Market

According to the report "CII-Ernst and Young Textile and Apparel Report, 2007: India in the Global Textiles Eco-System", the size of the Indian textile and apparel industry is US$ 49 billion (61% is the domestic market and 39% composed of the export market). Textiles account for 59% of the industry and remainder is composed of apparel.

The domestic market is expected to grow at a 6.5% of the Compound Annual Growth Rate (CAGR). As the size of the pie gets bigger, eco-friendly products will definitely find takers.

According to the primary research, there is optimism about these products and most of the key actors in the eco-friendly domain have witnessed good growth.

The urban home furnishings retail market is estimated to be Rs. 9,300 crore and expected to reach Rs. 20,000 crore by 2012. Bed and bath furnishing products make up two-thirds of the market in the country.

As is evident from the table below, the apparel market is projected to witness significant growth, partly because of the expanding rural market. The urban home furnishings retail market is estimated to be Rs. 9,300 crore and expected to reach Rs. 20,000 crore by 2012. Bed and bath furnishing products make up two-thirds of the market in the country.

Table 26: Market Size of the Apparel Market in India[93]

Serial Number	Sector	Estimated Market Size (2007) in US$	Projected Growth (2009)
1	Men's apparel	US$ 8.1 billion	Range of US$ 13.5-14 billion
2	Women's apparel	US$ 6.7 billion	US$ 11 billion
3	Children's apparel	US$ 4.7 billion	US$ 11 billion

Willingness of customers to experiment with purchases, and if satisfied with the quality, repeat purchases

Two-thirds of the Indian population is under 35 years of age, with the median age is 24 years. This demographic factor coupled with the rise in the disposable income of the middle class. The consumer survey also hinted towards a growing number of young people who are interested in the eco-friendly products, which a very favourable factor.

Specifically in the eco-friendly domain, the research shows the following opportunities:

[93] "India in the Global Textiles Ecosystem." Textile and Apparel Report, 2007. New Delhi: Ernst and Young and Confederation of Indian Industry (CII) and Ministry of Textiles, Government of India, 2007.

- Willingness of customers to experiment with purchases, and if satisfied with the quality, repeat purchases
- Prospects for some fast moving and consistent performance among accessories, furnishings, garments (reference Table 13: Trend Analysis of the Eco-Friendly Products in the Market)
- If the prices of organic cotton/fibre are reduced its likely there will be significant increase in sales, as customers correlate eco-friendly products with organic cotton or fibre
- Lack of variety among eco-friendly products, creating lots of space to innovate and diversify product ranges
- Using the terms "eco-friendly," "handcrafted," "natural," or "organic" combined with a good design, quality components and an appropriate price could help immediately establish any eco-friendly product in the current market

Challenges

Cost Competitiveness

With globalisation, there is huge competition from substitutes of the eco-friendly products. Currently there are not enough global players in the market, but with more entering competition will increase within the eco-friendly domain. Artisan groups will have to become more competitive, which is directly linked to costs.

It is important to identify the concerns, fears and desires every consumer has at a subconscious level. Customers buy "handloom" and "handicraft" products, presuming with they are eco-friendly and would especially like to buy products that are on the higher side of the eco-friendly spectrum.

Branding in the Eco-Friendly Domain

Eco-friendly is a widely used term and tends to include products from various categories. If the artisanal and handcrafted groups are to tap into the "eco-friendly" market then their branding has to be more than just the eco-friendly.

Stereotypical Associations made with Eco-Friendly Garments

One major misconception by consumers is that eco-friendly garments tend to look dull and drab, and are only available in plain fabrics and neutral colours.

To address this misconception, producers can, using the correct dyes and processes, produce environmentally friendly garments in a wide range of attractive colours and fabrics.

Demand and Supply Issues related to Eco-Friendly Products

Supply and demand within the textile market are also factors affecting the growth of the eco-friendly textile product market. One issue is the lack of information regarding what to demand/ request of eco-friendly textile products, in terms of process and the final product. Eco-friendly products should be processed in a non-polluting manner, however, it is impossible to know whether such a process has been followed or not. This gives customers a strong preference for labelling.

Since there is little demand-pull from consumers, pricing must be rather conservative, which results in low profit margins for the producers and other members of the distribution chain.

Another problem is not enough supply. The volume, variety, range of eco-friendly products is insufficient. In addition, very few products claim to be eco-friendly, and as a result, the label does not register deeply with customer, and thus does not

Lack of variety among eco-friendly products, creating lots of space to innovate and diversify product ranges.

factor into the decision to buy. Finally, those producing the products are not able to promote their products effectively or charge appropriate prices.

The market survey data clearly indicates that consumers are willing to purchase eco-friendly products, even to pay a premium for such products, provided the products were certified or labelled as eco-friendly.

Recommendations for Addressing Challenges

- Make the distribution chain as short as possible - if possible, the producer should directly sell their products
- Develop products targeted at young professionals
- Target products to both young men and women (who are the main purchasers)
- Promote the eco-friendly concept extensively using the Public-Private-Partnership (PPP) model
- Coordinate efforts to popularize eco-friendly products - draw on successfully cases, like the marketing of eco-friendly bags
- Restart the eco-labelling initiative - the government effort did not really work, especially in case of textile products
- Bring the theory of "contact" into the public consciousness, since it directly affects the market for products like bed linen and garments
- Develop niche areas such as items for infants and children, and a maternity wear line
- Make the eco-friendly pitch loud and clear, coupled with product quality and diversity
- Make an effort to convert middle class consumers to "eco-consumers"
- Focus on the consumers who are not 100% convinced of the value of eco-friendly products by working on smart pricing and creating a real presence (long term) in the market
- Market and sell eco-friendly products, which in India fall into the category of innovative products from the consumers' perspective, differently than other offerings, because most customers are sceptical and wait until an "innovative product" is mass marketed - suggestions to sell these products include:
  - Educate customers about the importance of these products and about how they are different
  - Create specific messages for different customers, such as pitching products as 'high quality alternatives" not a regular product - avoid mass marketing in the beginning

5.2 Eco-Label Related Recommendations

Opportunities

The market survey data clearly indicates that consumers are willing to purchase eco-friendly products, even to pay a premium for such products, provided the products were certified or labelled as eco-friendly.

Challenges

Popularisation of the eco-friendly label is an issue along with working to deliver cost-benefits to the manufacturer/retailer. The eco-mark has no takers among textile and clothing manufacturers and retailers as of now. The key reasons for this are:

- Lack of proportionality between the cost of obtaining the eco-label and sales figures as consumers are not aware of the eco-mark's existence.
- The producer has to incur the cost of switching to green technologies and processes as well as to apply and obtain the certification. This translates into additional costs and by extension, a higher priced product as compared to non-eco-friendly products in the same category.

- If the producer has to incur the cost of promoting eco-friendliness as a desirable product criteria and/or to promote the eco-label the price of the product would rise astronomically.

Recommendations for Addressing Challenges

- Establish a national-level eco-label
- Generate awareness through a range of media, including print, TV, ads, pamphlets, posters, tags, and websites, which target in-store consumers and nascent market interest
- Encourage large-scale government participation, such as by introducing tax breaks to serve as an incentive to eco-producers and to lower costs

  In addition, the criteria for the eco-label should be standardization and contextualization. There is now a global move towards standardization of eco-labels under International Organization for Standardization (ISO) to create greater transparency in eco schemes.

Recommendations for Eco-Labelling

- Ensure the Indian eco-mark label does not have loose, relative criteria, as is the case in the current label but on globally accepted label patterns in order to garner respect for the label amongst international buyers
- Make the label context relevant to the domestic market
- Include within the label eco-services to provide some form of accreditation to service providers such as dyers and washers who do not produce the finished good, but are hired to provide specific services
- Take into account in the labelling process, criteria such as shrinkage, colour fastness, perspiration, long-term cost involved in maintenance of the product, recyclability, and bio-degradability - for instance, *sujani* quilts from Bihar and the *kantha* of West Bengal are traditionally intended as a means of recycling old worn out saris, but now most producer groups working on these crafts use new fabrics as the base

In order to help apply and monitor the eco-label, a five star gradation system can be adopted showing the extent of eco-friendliness of a product. By providing a gradation system, one is not only rewarding producers for any environmentally friendly behaviour but also simultaneously according greater value to more green companies.

In order to help apply and monitor the eco-label, a five star gradation system can be adopted showing the extent of eco-friendliness of a product. By providing a gradation system, one is not only rewarding producers for any environmentally friendly behaviour but also simultaneously according greater value to more green companies.

However, at the same time it would be wise to approach such a gradation after studying its success in other industries and analyzing to what extent it can be adopted the textile and clothing sector.

Finally, there are yet a number of unresolved issues such as whether gradation being given to the product is to be calculated based on the percentage of undesirable substances in the product, percentage of the pollution generated by its production process, or as percentage of its cost.

Another question is how much information the label should have. While creating awareness about eco-product it is necessary to strike a balance between overloading consumer with scientific jargon, which may not have any meaning for them and even may confuse them). In addition, it is necessary to educate consumers about the nature of the environmental damage caused by non-eco-friendly processes and products.

The key finding of the research was that the current market size for the eco-friendly products is small and the players are quite scattered, with only few large players. The sector right now is witnessing several

initiatives to commercialise the eco-friendly pitch wherein a segment of exporters are also exploring the domestic market. However, consumers' still feel they do not have enough choices and often think of eco-friendly products as expensive, luxury products.

There are major opportunities in this segment but there are also challenges at the macro level, especially related to common understanding and awareness of what eco-friendly textiles are and about the policies for its promotion.

A coordinated effort by all the key stakeholders is required to popularize the concept amongst the consumers as well as regular market players. There is lot of excitement in the industry with regard to eco-friendly products and if the artisanal and craft worker groups are to become essential stakeholders then a long-term intervention strategy is required at the production as well as at the consumption levels. It looks like the early starters that establish their brands in this domain will benefit the most.

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Annex 1: List of Respondents City-Wise

Delhi/National Capital Region (NCR)		
Anokhi	Jagdish stores	The Home Store
Arvind Brands Limited	Mura Collectives	The MaxiMum store
Eco Tussar silk	People tree	The shop
Floor n Furnishing	Pilakhua;s printing cluster	Impulse
G - line Creations	Ritu wears	Wills lifestyle
Good things	Sushila Gramodyog Limited	Good earth
HHEC (buying House)		
Bengaluru		
Bombay Swadeshi store	Nalli Lavanya	Hands of India
Chaya Nisarga	Serenity	New port Products (P) ltd
Cinanom	Svisti	Sarga Eco-textile
Deepika Govind	The Design Store	Tarshish Exports
Desi	Vaishnavi Industries	Yamini
Industree Crafts Foundation/ Mother Earth	Eco Seal	Swadeshi Store
Maspar	Gokuldas	Zeme Organics
Kolkota		
Sasha	FabIndia	Sasha-EDF
UNITED SALES AGENCY (Eco bags)	Red Oranges	Bani Thani
Weaver's Studio	Ekru Alluring Designs	Silk Khadi Seva Mandal
Kanishka	Shopper Stop	Rajyalakshmi Cotton Mills
Anokhi	Shashwati Nair	
Mumbai		
Bombay store	Alok Industries	Baaya Design
Raymond Ltd.	Adya International	Lifestyle (Home center)
Shopper Stop	The Bombay stores	Matayasa

Annex 2: Toxic Substances used in the Textile Industry[94]

The toxic substances used in the textile industry are known to have adverse side effects on human health and are extremely bad for the environment. A few illustrative examples are mentioned below.

A. Formaldehyde acts as a cross-linking agent to make an easy-care finish, which is intended to prevent shrinkage and to give the product a crease-resistant, smooth-dry, and soil releasing finish. The presence of formaldehyde in a garment or textile can be harmful to health especially through irritation of the mucous membranes and respiratory tract. In many countries, formaldehyde in textile and leather products is restricted.

B. Extractable heavy metals like Antimony (Sb), Arsenic (As), Lead (Pb), Cadmium (Cd) etc. are constituents of some dyes. They can also be found in natural fibres having been absorbed by plants through soil or air. Metals may also be introduced into textiles through the dyeing and finishing processes.

Once absorbed by humans, heavy metals tend to accumulate in internal organs like liver and kidney. The effects on health can be tremendous when high levels of accumulation are reached, e.g. lead will affect the nervous system. The effect is particularly serious in children due to impact on growth and their relatively low body mass.

C. Chromium (Cr.) is mainly an undesirable by-product generated during the leather tanning process. It is a strong oxidant and a heavy metal capable of poisoning humans and the environment.

D. Pesticides and herbicides residues for example, aldrine, carbaryl, DDD, DDE, DDT, dieldrine, etc. are used in the cultivation of natural plant fibres like cotton to combat insects, and also as moth protection during storage. Herbicides are weed-eradication and defoliant chemicals. They can be absorbed by the fibres and might remain in the final product. Most of them can be removed during manufacturing. Pesticide and herbicide residues are rated from slightly too strongly toxic and sometimes are very easily assimilated through skin. Lindane is a pesticide suspected to be cancer inducing.

E. Pentachlorophenol (PCP) and tetrachlorophenol (TeCP) to prevent mould spots caused by fungi, chlorinated phenols such as PCP are applied directly on textiles, leather and wood. Both PCP & TeCP are very toxic and regarded as cancer-inducing agents. Their chemical stability is very high and cannot be easily broken down.

F. PVC plasticizers – phthalates are the most popular plasticizers used to soften PVC, and add flexibility and workability. However, some studies have shown that under simulated conditions, softened PVC might release phthalates in quantities which have potentially hazardous effects on young children. European Union and certain states in the United States have implemented phthalates restrictions on childcare articles.

G. Organotin compounds -Tributyltin (TBT) is one of the organotin compounds used for anti- microbial finishing. In the textile industry, it has been used for preventing the bacterial degradation of sweat and the corresponding unpleasant odour of socks, shoes and sport clothes. Dibutyltin (DBT) is another organotin with various applications, such as PVC stabilisers, catalyst for electro-deposition paints and polyurethanes. High concentrations of these compounds are considered toxic. They can be absorbed through the skin and depending on the exposure may affect the nervous system.

[94] "Eco-Textiles." Intertek 2009 <http://www.intertek-labtest.com/brochures/Eco-Textiles>.

H. Azo/carcinogenic/allergenic dyes Azo dyes are the name of the group of nitrogen-based synthetic dyes that are often used for textiles. Some azo dyes may produce carcinogenic aromatic amines under certain conditions. In Europe, the Azocolourants Directive 2002/61/EC restricts 22 aromatic amines in textiles and leather. Some other dyes used in the textile industry are classified as having adverse effects on humans. Twenty disperse dyes are said to be allergenic, while seven dyes are classified as carcinogenic. These dyes may be absorbed through the skin with prolonged skin contact.

I. Chlorinated organic carriers are commonly used as auxiliaries in the dyeing of polyester. These are harmful and may induce liver malfunction, irritation to mucous membranes and the skin as well as reproductive disorders.

J. Biocides for textiles are usually organotins or quaternary ammonium compounds. They are toxic in nature. They are used as antifungal or antibacterial agents.

K. Flame retardants are added to textiles to delay or prevent fire. These chemicals can either be coatings or chemically bound in. PVC is very useful due to its flame retardant properties. Highly used examples are 2,3-dibromopropyl phosphate, polybrominated biphenyls (PBB) and polybrominated diphenylether (PBDE). Prolonged contact to high dosages of flame-retardants can cause impairment of the immune system, hypothyroidism, memory loss and joint stiffness.

L. pH value is a scale ranging from one to 14 to indicate acidity and alkalinity. Human skin is slightly acidic which inhibits the development of many diseases. Textiles in which the pH lies in the neutral (pH 7) or slightly acidic regions (below 7) are friendly to skin. Fabrics with extreme pH values can easily damage skin and may cause an allergic reaction.

M. Colour fastness (staining) if improved can reduce risk of adverse health effects. With poor colour fastness, dyes or pigments may be released into sweat and could be absorbed through skin. Four colour fastness tests are recommended for textiles with direct skin contact. They are colourfastness to water, to perspiration, to rubbing and to saliva (for babies).

N. Release of nickel found in alloys used for metal accessories on garments such as buttons, zippers, rivets etc. Some people are allergic to nickel, and when in contact with nickel-containing accessories for a long period, may experience serious skin irritation.

The European Union has issued Directive 94/27/EC to limit the use of nickel, under which the following two test methods are used for analysis EN 1811 and EN 12472.

Annex 3: Types of Eco-Labels as per Administrative Mechanism

First party labelling or self-declarations: This pertains to the labels or phrases established by individual producer groups. Such labels usually contain information pertaining to the specific environmental advantages of their products that the producer wishes to convey to the consumer through media or advertisement.[95]

Second party labelling: This pertains to labels established by industry associations for their members' products. Certification criteria for such labels are usually created by external expertise from academia and environmental organisations. Verification of compliance to the established criteria is achieved through internal certification procedures within the industry or employment of external certifying companies.[96]

Third party labelling: This pertains to labelling schemes established by a public or private institution independent from the producers, distributors, and sellers of the labelled products. The label or seal is typically licensed to a producer and may appear on/or accompany a product that met the criteria laid down by the label-initiating institution. Environmental organisations and consumers alike generally prefer third party labels because private commercial interest will not compromise the criteria applied to the schemes and compliances to criteria laid down will be based on verifiable and impartial certification procedures[97]

Most third party certification programmes are voluntary in nature and identify positive or neutral environmental aspects of a product. Certification programmes focussing on the positive aspects of the product are either seals of approval or single attribute certification schemes. In both cases, the criteria for certification are based on LCA and are reviewed frequently.

The review process is designed to ensure that only a small percentage of the products qualify for the label, the review also enables the labels to consistently raise the criteria for their label, thereby providing an incentive to the product manufacturers to improve the environmental attributes of their product.

- **Seal of approval:** takes into consideration many factors including environmental policy goals, consumer awareness of environmental issues, trade effects of imports and exports, economic condition of the domestic industry etc. The bulk of the responsibility rests with the decision-making board, which comprises of various stakeholders – academics, trade representatives, consumer organisations, environmental agencies and government representatives.

  Technical expertise is usually provided by governmental standard setting organisations, consultants, export panels or ad hoc task forces established to work on specific product categories. Governmental agencies may also be involved in the monitoring mechanisms or in administration of the scheme. Well-known seals of approvals include Germany's Blue Angel and the European Union's Eco Flower[98]

[95] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 7.
[96] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 7.
[97] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 7.
[98] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 7.

- **Single attribute certification programmes:** focus on defining specific attributes of a product such as its recyclability or bio-degradability. Products that meet the definition and have marketers who have entered an application, are awarded a logo these facts. For instance, a product may bear a "recycled" or "bio-degradable" label. Such labels are generally aimed at audiences already somewhat aware of basic eco-friendly criteria as well as at creating awareness among the less informed public.[99]

- **Neutral labelling programmes:** are usually mandatory and apply to aspects of the product that the customer is believed to have the right to know. The best known of these are related to the food and drugs industries where it is mandatory to disclose the contents of the product. Such labels are intended to allow users to make informed decisions regarding their purchases. However, they are of little use to less informed customers as they provide standardised statistical information and little interpretation of these figures.

- **Negative labelling:** are mandatory hazard warnings that appear on products containing potentially harmful or hazardous ingredients. They are intended to alert customers to the dangerous nature of the product and to encourage its safe disposal. Such labels are usually initiated by government agencies but may also be voluntarily provided by manufacturers as a means of absolving themselves of liability in case the product is misused. Such labels are most often seen on explosives, chemicals etc. Eco-labels may also be differentiated based on the manner in which they are administered – independent/private labels, national labels, and multinational labels.

- **Non-governmental organisations (NGOs) or research institutions usually issue independent labels:** These labels take into account either the entire life cycle of the product or the end product's quality. For instance, Ecotex 100, Ecotex 1000 and Toxproof etc. are institution related. AKN Trademark is related to a producer association in Germany while Steilmann, Otto Versand, Hess Natur and Green Cotton are examples of company related eco-labels.

- **National labels:** are issues by governments of various countries and are designed to provide manufacturers with an opportunity to enter new markets and/or address certain market niches. They address the domestic market and the environmental issues most relevant to that particular economy and ecology; for instance, the Eco Mark of India, the Eko-Seal of Holland, the Green Mark of Taiwan, the Eco Mark of Korea, and the Environmental Choice of Canada.

- **Multinational labels:** are issued by a multinational entity. These labels address the environmental impact of a particular region. The EU Flower label and the Nordic eco-label are examples of multinational eco-labels. Government or public sector support in running eco-labelling schemes has many advantages:[100]

- It improves the programmes economic stability, local protection, credibility with manufacturers and consumers

- It provides dependable long term resources

[99] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 7-8.
[100] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 9.

- It helps overcome high start-up and monitoring costs, thereby allowing lower prices and greater participation from small and medium-scale enterprises (SMEs)
- It allows facilitation of an international standard
- It provides technical expertise in certain areas
- Ensures public observation, review and comment on proposed standards

However, the private sector labels may be less vulnerable to shifting political currents and budget constraints than government run programmes. They may also be more able to set most stringent standards than government agencies in some production centres, as they do not have to take into consideration social implications such as job losses generated because of shifting to 'green' technologies. Private sector labels may also be an effective means of pressurising foreign companies and countries to comply with environmental legislation.[101]

In addition to joint government-private sector or public-private participation, the quality, cost-effectiveness and efficiency of eco-labelling schemes may also be strengthened through the incorporation of leading organisations, groups and individuals with research credentials, expertise in criteria development and review processes.[102]

[101] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 9.

[102] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 9.

Annex 4: Standardisation of Eco-Labels

All eco-labels currently serve primarily as a marketing instrument targeted at niche markets. Creation of environmental awareness, consumer education and information regarding environmentally preferable products are strategies used by promoters of individual labels to create wider visibility for their certifications.

The ISO[103] has undertaken efforts to attempt to standardise the principles, practices and key characteristics relating to three major voluntary environmental labelling types:

Type 1 labels: These are voluntary, multiple-criteria based, third party programmes that award a license authorising the use of environmental labels on a product to indicate it is environmentally preferable in comparison to other products within the same product category based on life cycle considerations.

Type 2 labels: These are informative environmental self-declaration claims

Type 3 labels (Quantified Product Information (QPI) labels): These voluntary programs provide quantified environmental data of a product, under preset categories of parameters set by a qualified third party and based on life cycle assessment, and verified by that or another qualified third party.

Title[104]

Label types	Metrics	Life cycle assessment	Selectivity	Third party assessment	Standard
Environmental labels (Type 1)	Multiple	Yes	Yes	Yes	ISO 14024
Self declared environmental claims (Type 2)	Single	No	No	Preferred	ISO 14021
Quantified product information(Type 3)	Multiple	Yes	No	Yes	ISO 14025

Besides ISO, another agency involved actively in eco-labelling is the Global Eco-labelling Network (GEN). GEN is a network of non-profit organisations around the world that issues eco-labelling certification to foreign applicants.

They participate in eco-labelling activities of the United Nations Environmental Programme (UNEP), ISO, and the World Trade Organization (WTO). It also develops criteria and analyses of such issues as eco-labels and trade, harmonisation programmes, and enables information exchange among members with regard to criteria setting, marketing, green procurement etc.[105]

[103] ISO is a worldwide federation of national standard bodies from 140 countries. It was established in 1947 to promote development of international standards through international agreements. "ISO Standards." 2009. International Organization for Standarization (ISO). <http://www.iso.org/iso/iso_catalogue.htm>.

[104] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006.

[105] Nadiger, G. S. and J. Samuel, editors. "Chapter 1: Textiles and Eco-labels." Compendium on Eco Labels: 1st Edition. New Delhi: Textiles Committee, 2006. 11.

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Front Cover - Uttrakhand Bamboo and Fibre Development Board artisan. Photograph by Sharmila Wood, AIACA, 2009
Back Cover - Weaver from Tripura working on bobbin winder. Photograph by Saurabh Dey, AIACA, 2009