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## Greening textile industry reduces environmental pollution- A research on eco-friendly garments

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**Abstract-** Consumers are becoming more conscious of the importance of environmental protection, & businesses use these words to advertise their products or services with eco-labels. Environmentally sustainable (also eco-friendly, nature friendly & green) refers to products and services, regulations, rules & strategies that claim to do little or no damage to the ecosystem. Clothing is an important part of our lives, & green or eco-friendly issues have begun to gain momentum in the textile and clothing industries. This paper examined how greening the textile & clothing industry can help in reducing environmental pollution with respect to the product lifecycle, From raw materials to design, manufacturing, & logistics, as well as disposal, key points & criteria for greening the industry are highlighted.

**Key words:** Textile, Eco-friendly, Pollution, Industry, Green Industry.

### INTRODUCTION

Since time immemorial, the textile industry has been well known for its superior quality and design. India has long been a key manufacturer of textiles to countries on all continents. It is one of the country's largest and oldest industries and one of the most significant in terms of efficiency, development & employment. The textile industry directly or indirectly employs approximately 35 million people. Besides this, it makes major financial investments. It accounts for 4% of the GDP, 9% of excise collection, 14% of total industrial output, 16% of total export earnings & 18% of industrial employment. One out of every six households in the country is estimated to rely on this sector for their livelihood, either directly or indirectly. Global production of processed fibers & massive synthetic materials increased by 3.3% per year from 52.6

million tons in 2000 to 70.5 million tons in 2008. During that time, the percentage of imported fibers rose from 59 to 63 per cent. In 2011, global textile production in 2011 reached over 51 million metric tons of processed fibers & 30 million metric tons of synthetic materials, total record reflecting 1 per cent rise from fiber production in 2010 & per capita production of 12 kg. Manufactured fiber consumption has gradually increased over the last 3-4 years, synthetic fibers, on the other hand, consumption has remained constant & has started to decrease.

The textile industry is the largest relevant industrial sector including fiber to ginning, weaving, cloth, dyeing & printing, made ups & apparel. It has the largest distribution network, & intrinsic value-added capacity from each production point. The industry generates approximately one-fourth of all industry real worth & employs 40 per cent of all workers in the industry. Textiles have accounted for around 60% of national exports on average, excluding cyclical & seasonal variations. Textile

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& garment exports now account for approximately 6% of overall global exports. Many LDCs and small developing countries have formed a heavy dependence on the industry, which accounts for more than 90% of industrial exports and more than half of total jobs in many of them. Many sectors of the textile industry are rising production efficiency as a result of intensified global competition.

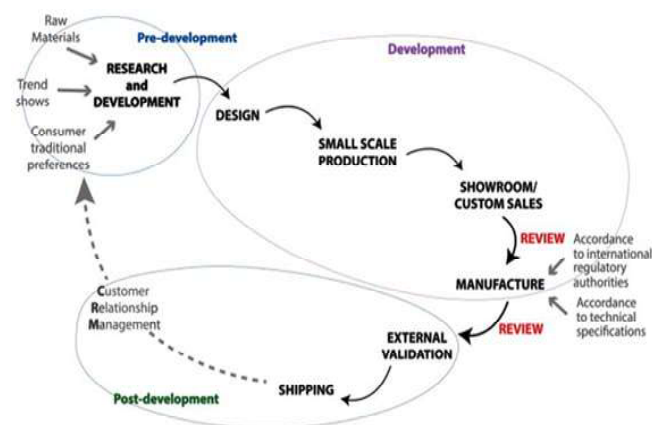
Environmental pollution is a serious problem that humanity is currently dealing with. Clients were becoming more environmentally conscious as a result of global warming and increased awareness. 'Green' principles and techniques have become essential for organisations as widespread awareness of their environmental impacts has grown. Green textiles offer consumers more eco-friendly options. Climate-related words are used here to refer to legislation, products & services, strategies & guiding principles that do the least amount of harm to the environment.

It is also essential in green clothing to recognize the item's existence and the extent to which it affects the environment during its life expectancy. Furthermore, to obtain green clothing, effective management is needed at all levels, starting with environmental planning, purchasing raw materials, manufacturing garments, disseminating them to channels and shops, and, finally, considering their reverse logistics. Essentially, the goal of green clothing is to transform the manufacturing system to become more energy-efficient while avoiding environmental damage. Green manufacturing plants have developed suppliers or subcontractors' networks to purchase environmentally friendly products and then enforce basic practices to minimise waste and increase operating efficiencies. The purpose is to use environmentally friendly fabrics to mitigate environmental risks and obtain sustainable clothing while also opening new markets and rising competitive advantage in the textile industry.

The word "eco-friendly" refers to products and services, regulations, rules, & regulations that are believed to cause little or no damage to the environment. Green is a highly subjective concept. Green or environmentally products, facilities, & activities ensure using eco-friendly products, free from hazardous materials, chemicals & wastage that don't drain the eco-system while production & manufacturing. Environmentally garments are made from eco-friendly & natural resources, & effective management of acquiring sustainable garments necessitates considering all steps, beginning with constructing for the

climate, sourcing raw materials, manufacturing clothes, selling items through networks & retailers, and considering reverse coordination and waste disposal.

Clothing industry is the world's largest & oldest manufacturing industry. According to the United Nations Environment Program, the fashion industry, which includes textile and apparel development and processing, is the world's second-largest trade activity. The global industry is worth \$1.44 trillion (about \$4,400 per person in the US). In 2010, Indian market produced \$63 billion (about \$190 per person in the US) accounted to 14 per cent of manufacturing output & 4.5 per cent of Gross domestic product. India is world's biggest garments & textile industries, recruits 35 million people (about twice the population of New York), second only to farming. In India, there are 30,000 garment manufacturing companies that only manufacture for export. 5,000 of these organizations are well known in terms of efficiency and sustainability.



**Fig. 1 Current Framework of Textile development process in the industry**

## LITERATURE REVIEW

In his paper, Eryuruk, S. H. (2012)<sup>1</sup> examined "how green the fabric& garment business is concerning product lifecycle, from natural resources via manufacturing, design & logistics up to disposal to highlight key points & criteria for greening the industry." Clothing is an essential part of our lives, & environmental or green concerns have begun to gain traction in the textile and clothing industries.

According to Clarke *et al.* (2013)<sup>2</sup>, "pollution reduction programmes in Bangladesh are significantly underutilized as compared to the most successful companies in developing countries." All of the industries engaged in some form of pollution control, though each had room for development. For instance, neither of the

selection function was involved in emission reduction by developing eco-friendly goods.

In his article, Rao (2004)<sup>3</sup> investigates the significance of "greening of production" in the South-East Asian context. It studies the numerous initiatives undertaken by the companies in this region and, as a result, identifies the factors crucial in the phase of greening development in this area. The factors' importance is determined & confirmed via an experimental study conducted across five countries in the area using the structural equation modelling method.

In their report, Caniato *et al.* (2012)<sup>4</sup> present "the findings of an explorative scenario study that sought to identify 3 elements: the forces driving businesses to implement "Green" practices, various practices which can be used to enhance sustainable development, & the ecological KPIs assessed by fashion companies." The study's results compare two approaches taken by established multinational firms with green-positioned brands with the initiatives of small businesses who have embraced alternative supply chain models.

In his paper, Dawson (2012)<sup>5</sup> stated that "many concepts from the comparatively recent study of green technology, that seeks to use energy effectively & reduce wastage, are relevant in the field of textiles." It is a practical aim to increase higher quantities while minimizing environmental effect in manufacture & eventual coloration of synthetic fibers. While the demand for organic fibers is still limited, public's interest in sustainably grown synthetic materials have mirrored that in sustainably food grown. With special reference to these newer fibers, the methods used to reduce the environmental impact of fiber, pigment manufacturing and corresponding coloration methods are listed.

In their article, Hole (2019)<sup>6</sup> address eco-friendly achievements in the textile industry's growth, focusing on three key participants: Recycling, Consumption & Production. Which demonstrates, despite substantial eco-friendly technology advances in textile industry, reuse & market recognition has a low level of sustainability in the manufacturing industry. Textile industry has compared to others (paper, aluminum, glass) and a better recycling rate. Textile waste disposal legislation and the lack of international textile waste disposal standardization is also addressed with an increasing demand & a lower recycling rate in fabric industry. It isn't easy to achieve required

stability between environmental & industrial processes to extend the life span of textile industry.

Mukherjee (2015)<sup>7</sup> wrote in his paper, "The fashion industry is complex & diverse, with four or more levels, including layout, yarn production, raw material gathering, dyeing, weaving, stitching, & fabric creation". Quick apparel refers to clothing with a limited project life cycle have arisen a formidable competitor. Quick fashion has resulted in an increase in consumption as well as increased waste. Quick fashion produces waste at any point in the textile life cycle, posing occupational & environmental risks. Because of the vast number of goods made, used, and discarded, & the clothing business retains the major eco-friendly effect at every single point of produce life cycle. While speak just about the world, we refer to both the social & natural environments, and the development process includes the manipulation of both social & natural environments. Sustainable & ethical design is a reaction to the social & environmental destruction caused via traditional manufacturing methods. The informative, analytical report seeks to raise customer awareness of the physiological needs which apparel serves & know the complete life cycle effects on clothes, from raw sources to waste.

According to Mia *et al.* (2019)<sup>8</sup>, this study aims to focus on the current pollution situation in Bangladesh's printing & dyeing industry as a result of various textile pollutants while our country's economy is growing as a result of small & medium-sized manufacturing processes. The dyeing and printing industry's hazardous waste disposal is heavily polluting the atmosphere. Since the country's textile industries' growth, liquid and solid effluents from various industries have been wreaking havoc on the atmosphere, biodiversity, farming, aquaculture, and public health. It's necessary to take appropriate measures to reduce emissions in every industrial firm, especially in printing & color which discharge significant amounts of liquid waste into waterways daily.

Choi *et al.* (2012)<sup>9</sup> write, "This article aims to illustrate why garment industry must "go green," as well as analyze business strategies & sustainable development." The authors use Five R method to analyze the launch, execution & institutionalization voyage of a regional style business, yielding valuable observations & results. This is qualitative experimental research. The Five R abstract structures is tested, suggested, & used to true-world study.

According to this literature review that have been congregate & evaluated thus far, fashion industries gain a contrasting edge via strategic control of natural difficulties. Apparel industries closely recognize the product development cycle & expand governance through several product lifecycles in their greening initiatives. The Five R platform, along with its potential expansions, will provide an opportunity to specifically illustrate what the company has accomplished to date and concisely illustrate where the company is missing or where there is space for more beneficial growth. Desore *et al.* (2018)<sup>10</sup> review the existing literature on numerous environmental problems affecting the global textile industry in their paper. The researchers categorize the research to address the factors, obstacles, & reactions of textile industry regarding sustainability. Even though there is an increasing lot of literature in the field, they find substantial differences in this paper, particularly regarding managerial approaches to integrating sustainability. While it is critical to understand why push firms toward sustainability, and the barriers to adoption, research on managerial perceptions of current methods & techniques is relevant. Future development possibilities are also provided in the form of questions in the paper, which reinforce the current literature in this area. Shen *et al.* (2017)<sup>11</sup> seek to address resource group along with low carbon footprint activities in the textile industry of China in their paper. To ensure a low-carbon economy's viability, the Chinese government has implemented a restrictive regulatory framework and placed a power consumption limit in the Textile Company. The authors want to see how energy consumption constraints influence optimal decisions of distribution network members & solve the distribution network management problem.

The analysts investigate the effect of energy usage restrictions on Chinese textile companies' development & business operations using two methodologies. The analysts create straight forward analysis method for low carbon distribution chain comprised of a single retailer & a single producer based on actual world business practices, the producer prefers renewable sources improved efficiency & to reduce pollution. The authors also discover that fabric business implement renewable technology to minimize emissions during the manufacturing process to comply with energy usage regulations.

In the empirical method, the analysts extract the appropriate decision of distribution chain representatives

and demonstrate that supply chain cooperation accomplished if the producer accurately fixed the selling price. However, manufacturing capacity will satisfy a portion of market conditions under a cost-sharing arrangement & the cost-sharing agreement can encourage supplier to expand clean technology investing while decreasing the optimal WS.

## **ANALYSIS & DISCUSSION**

A substantial extent of study has been done on environmentally customer habits that have contributed to the increase of procedures like ecologically marketing (Thgersen, 1999)<sup>12</sup> & eco-labelled items (D'Souza, 2004)<sup>13</sup>. For starters, results provide clear empirical evidence to the role of societal standards in a democratic society, the perspective of consumption. Previous research has often changed TRA & TPB to examine the effect of arbitrary rules on eco-friendly activities.<sup>14</sup> However, there has been no research on the efficacy of descriptive norms in apparel shopping, considering the difference between injunctive & descriptive norms. Existing research demonstrates that both of the explanatory standard & injunctive. Even though environmental considerations are significant, rules have a larger impact on purchasing intentions. The last is a big factor of environmentally responsive behaviour.<sup>15</sup>

Thus, the present results verify formed concept that studying the behaviour of others immense significance in the decision-making in eco logical usage as behaviours frequently take position in a societal perspective.<sup>16-18</sup> As a result, current results support long-held belief that studying the actions of others.

Next, results revealed that manufacturer's eco-friendly advertising argument mitigates environmental issue & injunctive norms on customer purchasing intentions. In particular, when paired with an extrinsic argument, descriptive norms have a stronger impact on purchase intention than when paired with an inherent claim. In contrast, concern for the environment has a stronger impact on buying intention while paired with an inherent allegation than when paired with an external claim provided that environmentally friendly behaviours tend to be affected through extrinsically motivation or internally motivation, the finding leads to greater considerate with customers' multiple motives for buying eco-friendly items.

Furthermore, injunctive standard and environmental interest can play a moderating role. Explain why previous research came to conflicting decisions about the effects of

ecological statements in apparel ads.<sup>19,20</sup> In contrast, inherent advertising assertions including intrinsically environmentally friendly goods set off private eco-friendly issue more significantly than external selling claims.

Tertiary, these findings revealed that descriptive norms had little impact on purchasing intentions. Depending on the form of argument, they can differ. In contrast to injunctive standards, factual rules are based on situational rather than individual factors. People are sensitive to other people's actions, regardless of the claim form; hence, the subjective norms caused through a shopping condition influence customers' purchasing plans regardless of the kind of ecological assertion made. By studying others' actions, consumers tend to seek clues from which to view any condition & infer similar social norms.<sup>16</sup>

## **CONCLUSION**

This study paper focused on pollution control practices in textile dyeing and printing. The majority of factories do not adhere to the laws and regulations. As a result, strict guidelines are required, and the government must monitor whether the companies are abiding by the laws or not. The company generates waste, which must be handled regularly. Furthermore, an additional initiative is needed because air & water emissions as well as soil & noise emissions are on the rise. Action against this is critical, but it sadly lacks in printing & dyeing industries.

The government of India's ministry of environment & forests introduced a programme in 1991, i.e., essentially a system for marking environmentally friendly goods, to raise consciousness regarding the natural effects of goods. It is known as the "Eco Mark" scheme, and it seeks to make it simple to identify environmentally friendly goods. The plan is focused on a "cradle to grave" strategy, which considers a product's effect from raw material production to manufacturing to ultimate disposition. As ethical buyers, it is our duty to buy goods based on their environmental friendliness. Our awareness will force manufacturers to pursue more eco-friendly garment & a healthier and greener world.

Industrial pollution can devastate water systems and lakes, which are important to biodiversity and the lives of billions of people. Harmful contaminants released via Industry have such a wide variety of negative effects, including cancer, hormone disruption, and reproductive system interference. These effects can affect all living things, not just humans. There is a proof that the Textile

Industry contributes significantly to water contamination, with the utilize & dismiss of toxic chemicals.

The existence of dangerous substances in the atmosphere demonstrates that the conventional solution to wastewater wastes are ineffective-inefficient water systems cannot handle a wide range of toxic chemicals. These implications for human health & habitats are serious, & hazardous material cleanup is a time-consuming and expensive operation. A new approach to dangerous materials is needed that tackles the issue at the resource rather than in the end. The concepts of "zero discharge" removing each of dangerous chemical dismiss into the marine environment are focused on the realization that acceptable standards for certain hazardous contaminants are difficult to establish. The best solution has proved to be the renovation of commodity & systems to drive out the use & disposal of dangerous chemicals. To keep track of their environmental effects, LCA should be done regularly, particularly for new products and processes. As a result, measures must be taken to minimize emissions and make textile goods and processes more environmentally friendly.

Environmental concerns influence all human activities. Green marketing of the garment industry has become increasingly important as customers become more concerned about the environment and health. It protects the organization's interests and the interests of all of its customers both the buyer and the seller profit from the deal. Enterprises, as the backbone of the garment industry, are actively involved in its operations. Enterprises must implement new green marketing tactics; forego short-term gains in favour of long-term environmental conservation gains. Only by doing so would they maintain their place in the international market and thrive indefinitely. Finally, the garment industry will be able to develop sustainably.

Textiles can be one of the world's least sustainable goods. They can cause serious problems over the complete process, including raw material production or creation from oil to manufacturing, selling, & then disposal. There are advantages at various phases of the sustainable & environmental textile industry, for both suppliers & users, but on a large scale, it's necessary to remember that environmental textile industry & garments can fly halfway across the globe to meet the moral customer. If the market for these environmental clothing grows; new entrepreneurs have a significant opportunity to enter this sector.

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