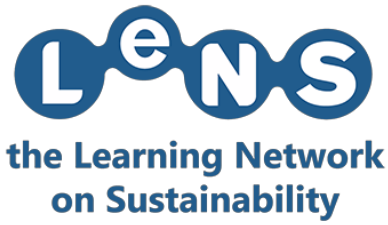

Home Textile: an Analysis of Environmental and Economical Impacts In Brazil

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ABSTRACT

The goal of this paper is to analyze the environmental impact of the home textile sector in Brazil since 2010, in the production of raw materials and textile waste affecting the environment. The textile and garment sector is very relevant to the Brazilian economy as it is the second major job provider. The methods for this research will utilize information from systematic literature review and field investigation with technical visits and semi-structured interviews to companies linked to the home textile sector. With growing consumer awareness, the eco-friendly concept has become a trend in the home textile industry, which is considered the most environmentally damaging industry currently. The impacts of greater consequences of the home textile industry to the environment are: increase of solid waste, contamination of rivers and seas, contamination of the soil with sequels, it became infertile among others. This paper presents solutions to reduce them.

1. INTRODUCTION

The trousseau is popular from its antiquity to the present day, undergoing several modifications. These changes are reflected in the type of fabric, in the way it is made and in its market share. The most commonly used material is 100% cotton. The polyester / cotton blend is used to a lesser extent, although its advantages are shrink resistance and durability (DAS SUBATRA, 2010). This study is to analyze the environmental impact of the home textile sector in Brazil since 2010, in the process of producing raw material and textile waste affecting the environment. The textile and garment sector is very relevant to the Brazilian economy as it is the second major job provider. The textile industry has generated 1,5 millions job opportunities in 2016 confirming its relevancy to economic and social impacts. (IEMI, 2018). The home textile production originally started with hand-made spinning and weaving by women who had this family responsibility. The introduction of design as a conceptual factor to improve the products creation, transformed the old trousseau into the modern concept of Homewear or Home Fashion, following fashion trends by improving shapes, colors, textures and patterns, so that home textiles became fashion. (PINTO, 2009). In the textile industry, cotton fiber is the most important natural material, especially considering eco-efficiency as it requires neither mechanical nor costly chemical treatment. It is washable and more resistant than wool, from its core it extracts the edible oil and the milling of its residues in bran is used for feeding the cattle or as fertilizer in planting. The methods for this research will utilize information from systematic literature review and field investigation with technical visits and semi-structured interviews to companies linked to the home textile sector. With growing consumer awareness, the eco-friendly concept has become a trend in the home textile industry, which is considered the most environmentally damaging industry currently (DAS SUBATRA, 2010). The impacts of greater consequences of the home textile industry to the environment are: increase of solid waste, contamination of rivers, seas and soil. This paper presents solutions to reduce them.

2. RESEARCH PROBLEM / GOALS

Analysis of the environmental impact of the home textile sector in Brazil, in recent years, in the production of raw materials and solid waste in the environment.

3. THEORETICAL BACKGROUND

The present study carried out an analysis of four important points to give foundation to this article: the Textile Industry in Brazil; the bedding, table and bath linen sector; the productive process of cotton and its environmental and economic impact; and finally the Impacts of textile waste.

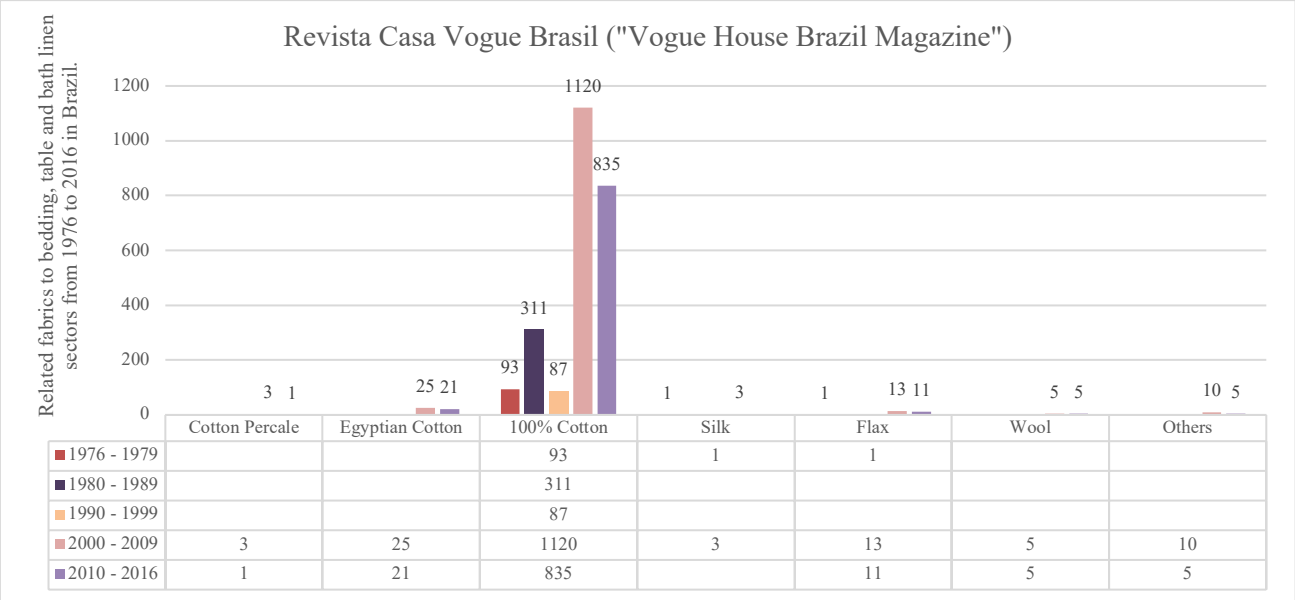
3.1. The Textile Industry in Brazil

The textile and confection sector is the second largest sector in Brazil in job creation. According to the "Ministry of Development, Industry and Foreign Trade", in 2010, 1.7 million employees were registered, of which 75% of this amount is made up of female labor. It represents 3.5% of PIB and has a large volume of production, making a total of 9.8 billion pieces per year. The IEMI (2017) highlights the Brazilian textile and apparel production chain, both because of the importance of its production and because of its ability to generate jobs.

3.2. The Bedding, Table and Bath Linen Sector (Home Textile)

The composition of home textile (trousseau) including basic items like towels and sheets continue to be part of the wedding lists, varying in technical attributes such as the finish. According to Pinto et al. (2010), many trousseau companies have begun investing in design as a distinguishing factor, turning the old trousseau into the modern Homewear or Home Fashion concept, following fashion trends by improving shapes, colors, textures and patterns. This process transformed the marriage trousseau into a fashion product.

The author Laktim et al (2017) presents a study of forty years of publicity in a magazine of national and international impact to Vogue Living Brazil (Casa Vogue Brasil). Figure 01 shows the consumption of the most used materials in Brazil in bedding, table and bath linen products highlighting cotton fabrics due to their properties.



[Figure 1] *Related fabrics to bedding, table and bath linen sectors from 1976 to 2016 in Brazil. (Font:* Laktim, 2017*)*

The largest growing markets in all categories of home textile products are in Brazil, Russia, India and China. The World Trade Organization's World Report on the Textile Market (2005) showed that the United States was the largest importer of domestic textile products (34.3%), followed by Germany (11.6%), Japan (10% 9%), the United Kingdom (8.3%), France (6.5%) and Canada (4.2%). On the other hand, the largest exporter of domestic textile products was China with 33.4% of the world market, followed by Pakistan (12.1%), India (9.7%), Turkey (6.6%), Portugal (4.8%) and Mexico (4.5%). It is believed that China will remain the world leader in exports, while it is uncertain that the US will be the largest importer of home textile products (DAS SUBATRA, 2010).

3.3. Cotton: Its productive process and the environmental and economic impact

Cotton is among the most respectable fiber crops in the world. According to the Brazilian Association of Cotton Producers - ABRAPA (2018), around 35 million hectares of cotton are planted all over the world, with about 1.13 million hectares in Brazil. In the international market there is the ideological belief that it should be possible to make more sustainable textiles. Das Subrata (2010) states that industries recognize that the environmental impact of textiles lies in the supply chain, from chemical fertilizers and insecticides to chemical treatments used in refining, spinning, dyeing and weaving. Novotex has been instrumental in mapping this impact and helping suppliers use more sustainable methods. The company worked a "log book" for textiles to map the chemicals used in the production process.

Global cotton industry includes more than 100 million farm families across 75 countries (ICAC and FAO, 2015). Cotton is one of the most widespread crops in the world in terms of land area and its supply chain actors range from small farmers, intermediates, traders and ginners, to sophisticated mills, textile processors, brands, exporters, retailers and final consumers (Glin et al., 2012). However, conventional cotton production greatly overuses and misuses agrochemicals that have an adverse serious impact on the environment and agricultural workers (Chaudhry and Wakelyn, 2006; Rieple and Singh, 2010; Pal, 2014; Pal and Gander, 2018). Excessive use of insecticides and pesticides can significantly affect the natural biological control system, pollute soil and water resources (Chaudhry and Wakelyn, 2006; Yang et al, 2017).

At the same time, the interest in the use of sustainable raw materials has increased (Geissdoerfer, 2017), due to market demands on sustainable initiatives, the growth of awareness campaigns by some of the

world's major retailers and clients engagement (Rieple and Singh, 2010; Diabat et al., 2014). Sustainability has become one of the key factors for long-term business success (Macchion et al., 2015). Sustainable development has become, one of the strategic focal points of organizations (França et al., 2017). A sustainable business model aims at improving the economic, environmental, and social effectiveness integrated (Geissdoerfer et al., 2016), requiring a holistic approach to resource consideration and addressing the needs of partners and customers (Amit and Han, 2017). Organic cotton is consider more sustainable than conventional one, an environmentally preferable product, of added benefit to the environment, farms and consumers (Chaudhry and Wakelyn, 2006). Cotton is a strategic crop that it is grown in many countries (Chaudhry and Wakelyn, 2006; Adanacioglu and Akin Olgun, 2010). It is a hugely important crop in countries, such as India, China, United States, Brazil, Turkey, Australia (Rieple and Singh, 2010). It is the main natural fiber used in the textile industry (Fletcher, 2010). However, cotton is a leading agricultural non-food commodity associated with soil degradation, water pollution and pesticide poisoning due to high levels of agrochemical inputs (Chaudhry and Wakelyn, 2006; Caniato et al., 2012).

3.4. Impacts of Textile Waste

The Institute of Industrial Studies and Marketing – IEMI (2014), in its analysis of the textile and clothing sector, identified that in 2013 the textile and clothing chain generated around US $ 58.2 billion, which consists of 5.7% of the total value of the production of the Brazilian processing industry, eliminating the mineral extraction and civil construction trades, which fulfill the secondary sector of the Brazilian economy. However, there are a large amount of unused and discarded textile waste in landfills in Brazil, in 2012, 9,829,928 kg Liq of textile flaps and fabrics composed of silk, wool, cotton, artificial and synthetic fibers were imported, which is equivalent to to US $ 11,421,644.00 (FOB - Free on Board). This reveals the enormous demand for textile flaps for recycling and various purposes, as well as the production of blankets (for industrial and geotextile purposes), coatings, composites for industrial and civil construction purposes, fillers, yarn and string production, among others (SINDITÊXTIL-SP, 2013). Wang (2006) points out that recycled fibers are produced in a secondary processing cycle. To obtain them, the mechanical processes of waste defibration occur. Conventionally, the wastes are pre-treated by cutting or separating and then transported to undergo proper recycling, converting the consolidated material into individual fibers.

According to the study by Zonatti (2015), the Brazilian market involved in textile reuse and recycling opts to import instead of taking advantage of the national textile waste, in abundance, due to a series of problems related to the poor management of this material. There are various types of excrement mixed with waste, mixing of different raw materials and difficult separation, lack of fiscal and tax incentives relevant to textile recycling, few skilled and specialized labors. It emphasizes that in addition to disdaining national textile waste from industries and clothing, the Brazilian market for textile reuse and recycling, disregards the potential for inclusion of garments discarded by people after consumption, lack of reverse logistics.

4. RESEARCH METHOD

As for the objective this research is applied. Regarding the approach is qualitative-quantitative. The objectives are descriptive exploratory. The procedures used to collect information were bibliographic and documentary research, field research with technical visits and semi-structured interviews with companies related to the home textile sector in Brazil and Portugal.

5. RESULTS AND ANALYSIS

With growing consumer awareness, the concept of eco-friendly has become a trend in the home textile industry. Brazil is among the top ten world markets for the textile industry, it is the second largest supplier of indigo and the third largest producer of knitwear. Brazil is self-sufficient in cotton production and a world reference in beachwear, jeans and homemaking, producing 9.8 billion pieces of clothing per year, of which approximately 5.5 billion pieces of clothing (ABIT, 2017). In Brazil, the home line was the one that had the greatest growth from 2010 to 2014, with a high rate of 14% (IEMI, 2015). Therefore, the innovation models corroborate the indicator of the systematization of the procedure of the evolution of

the design and the home fashion industry, and the increase of participation in the market economy is its main goal. As a consequence, this study addresses an analysis of the consciousness of the industries in adopting and making their customers aware of consumption of eco-friendly products. According Das Subrata (2010, p.215):

> …India launched the eco-labelling scheme known as 'Ecomark' in 1991 for easy identification of environment-friendly products. Any product, which is made, used or disposed of in a way that significantly reduces the harm it would otherwise cause the environment, could be considered as environment-friendly product.

Two companies were interviewed, one national and one international, in Brazil the largest textile company, the Coteminas Group, and in Europe the Portuguese company More Textile, both with historical context of achievements in the bed, table and bathroom market.

The Coteminas Group in an interview of CEO Mário Sette highlights the new technological facilities to improve production and product quality and reduce environmental impacts such as the implementation of circular economy. He also underscores the new retail culture and how they have had to adapt market changes to product diversification from a 3,000 SKU (Stock Keeping Unit) in minimal batches, which was unthinkable in the past. There has been a profound change to meet this consumer who is increasingly fragmented, within each economic class and with completely different profiles. Consequently, its intention is to reduce the quantity of pieces in the same model, to reach all types of taste, and to produce its products from the demand, thus avoiding the discard of old collections and the excess of stocks.

In the company More Textile was interviewed Mrs. Isa Rodrigues, she talks about the appearance of the More Textile Group and its achievements in recent years, highlighting the awareness of reuse of textile waste in the production of fabrics, and leftovers in the cutting process. She also underscores the awareness of acquiring organic cotton in its collections that has the least environmental impact and as a process to make the consumer aware of acquiring a sustainable product, even if its consumption is low, due to the few suppliers of this raw material in the world, high cost, production does not meet demand.

The future of the home textile industry nowadays depends a lot on the eco-friendly as: fibers, natural dyes and chemicals of less impact to the environment, for example organic natural fiber fabrics and biodegradable fabrics, which decomposes rapidly after land disposal. Consumers and producers today with designers also have to get a look at the home textile. The society demands home textiles that satisfy the conscious or "green" consumer.

6. IMPACTS ON SUSTAINABILITY

The impact of the greater consequences of the home textile industry on the environment are: increase of solid waste, contamination of rivers and seas, contamination of the soil with sequels, like it becaming infertile among others. This study presents topics that can diminish these impacts, presenting two industries that already have this awareness and adopt sustainable forms and of less environmental impact.

7. CONCLUSION

To minimize environmental impacts, we can use tools for recycling, education and knowledge to reduce impacts. The awareness of companies and consumers in discarding textile waste, knowledge of the raw material, the origin of the product and the impact on the environment of its production are essential. We can conclude that all environmental impacts in relation to textile consumption can be reduced from the disclosure and incentives passed on to manufacturers and final consumers and with political incentives implanted. Large amount of wastewater is generated in textile industry due to the intensive water consumption and chemical usage (Fletcher and Grose, 2012; Pal and Gander, 2018). Researchers and practitioners are devoting increased attention to environmental sustainability, as they face the challenge of achieving a balance between environmental and business needs (Caniato et al., 2012). As sustainability labelling is gaining momentum in the global textile industry, opportunities for market expansion are increasing. Market innovation in its production procedures and clients engagement, can contribute to communicate to stakeholders the companies practices regarding cultural, social and environmental aspects (Magnusom et al., 2017; Matthews and Rothenberg, 2017).

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