

## **Application of sustainable design strategies to improve the competitiveness of apparel products in the Egyptian market**

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### **Introduction**

Fast fashion has emerged due to the constant need of the apparel industry to speed in production and distribution. Sustainability has emerged in apparel industry to create links among people on one side, environment, society and economy on the other. Apparel sustainability takes into consideration an efficient apparel design and production; it is the most important feature that distinguishes this trend, because it extends the life span of the product, whether in relation to the aesthetic form or functional aspects and thus reducing environmental, social and economic damage. Hence, this research aims to study the possibility of designing clothes in a way that supports the conversion of methods consumption towards more sustainable methods through the application of sustainable design strategies.

### **Sustainable apparel:**

A sustainable apparel system brings value to people, planet, and profit. Such system can provide the human being with a safe environment and enhances the feeling of satisfaction with the product, in addition to the growth of a feeling of peace and happiness through less material consumption. In this system, the consumer can tend to buy products of high quality, even for higher price as they can use it for longer periods.

Hence, activating sustainable methods in the garment industry includes three main directions:

- Create a new perspective in the design process (design).
- Follow industrial processes that take into account the environmental dimensions (production).
- Improving business practices (distribution).

### **Apparel sustainability applications:**

According to a survey of 4,000 fashion companies from 113 countries around the world, environmental sustainability has been permanently placed on the agendas of 70% of these companies, in addition to that two-thirds of the number of companies indicated that environmental sustainability is a necessity to compete. Some well-established brands have

developed strategies for apparel design and production sources such as H&M, Levi's, Patagonia, and Sekem.

### **Apparel sustainable design strategies:**

Designing apparel in the context of sustainability is related the processes of designing, producing, distributing and consuming products to benefit the environment, society and the economy. Researchers developed many systems that suggest sustainable apparel strategies to guide designers towards practices green apparel. "The wheel of eco-design strategy" or "life-cycle design strategies" is one of the most important systems in this field. It considers eight main eco-design strategies, which are developing a new concept, choosing low-impact materials, reducing environmental impact during use, limiting the use of resources, improving each of the manufacturing techniques, the distribution system, the consumption life, and the end-of-life system of the product.

Sandy Black has also developed a set of guidelines for a sustainable apparel design that include waste reusing, recycling, up-cycling, repairing, remodeling, re-designing, waste reduction, creating long-term products, designing multi-functional apparel and using ecological materials, uniform materials and new technologies.

Later, Allison Guillet developed a format to compare sustainable design strategies by traditional design process, aiming to shape a sustainable future and change the way of dressing life cycle stages. According to this form, sustainable apparel design considers the use of design strategies affecting the system as a whole, starting of the initial drawing stage, ending by final product. Among the goals of sustainable apparel design is to increase the emotional value of the product, and the consumer's attachment to it, and thus to prolong the life span of the product, which essentially requires the designer to meet the basic consumer needs in addition to aesthetic functions.

### **Practical study**

#### **Method:**

Tools:

- Design tools (papers, films, computer-drawing programs).
- Questionnaire.
- The Social Sciences Statistics Program (SPSS).
- Google Forms.

A sustainable design strategies proposed by the research has been designed, depending on the level of each strategy during the life cycle of the garment.

### **Production strategies**

**Reducing the impact of materials and stages:** Selected materials can be recycled easily and not harmful to the environment, two basic raw materials were adopted, Poplin (96% cotton, Spandex 4%) and voile (100% cotton).

**Durability:** Researchers tested the quality of the fabric used in terms of dimensional stability and resistance to friction and tearing. Fabrics were tested for friction resistance, tensile strength, and air permeability.

**Optimal use of raw materials and stages:** The research considered reducing waste in raw materials during operations in addition to reducing freight and transportation operations as much as possible to reduce fuel emissions; therefore, raw materials from local markets were used.

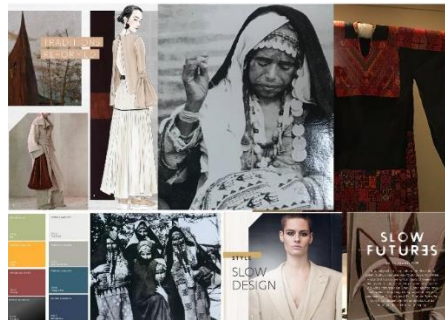
### **Consumer strategies**

**Design for the need:** Researchers focused on production techniques, sales methods, aesthetic needs of products that meet the needs of the consumer by following the design elements and foundations that fit international fashion trends.

**Emotional association with the product:** One of the elements that impedes the consumers' desire to acquire specific clothes is the aesthetic component, and the reason for this lies in the design concept of the emotional connection with the product or emotional design.

### **Proposed designs**

"Egyptian Fingertips" was the theme for the proposed collection. It aims to consolidate the meanings associated in identity through the Egyptian craft of distinctive hand embroidery in North Sinai targeting to achieve design sustainability in the Egyptian apparel industry. SS2020 fashion trends were followed, in addition, to benefiting of the silhouettes of women's robes in North Sinai.



**Inspiration board, designed by researchers**

A set of (20) designs were produced, according to the set of suggested sustainable design strategies during preparation. Strategies were divided into two levels; "productive" level was devoted to general strategies that apply to all designs and "consumer" strategies followed them individually for each design, as these strategies affect the purchasing decision-making process when shopping as well as in the next consumption stage.

### **Research instrument design**

A questionnaire method was used to determine the extent of achieving sustainability in women's apparel design by applying the suggested design strategies of the research.

Data was analyzed using the SPSS program to identify the evaluation of the designs according to the specialists, researchers implemented the five designs that obtained the highest ratios in the MOWA product range.

Based on these results, design aesthetics and its function are elements that influence consumer preferences and requirements. The aim of research as application of sustainability strategies in producing proposed designs was to achieve both aesthetic features and functional specifications, on which the emotional value of the apparel increases.

### **Aesthetic features of sustainable clothing design:**

The researchers found that the aesthetic features of clothing design depend on the aesthetic response; which is based on three elements: the shape is the basis of the design, the viewer is the observer of the shape, and the context is the surrounding atmosphere that affects the design vision.

In determining the functional characteristics of sustainable clothing design, researchers relied on the six functions of Victor Pabanic, which consists of:

1. Curriculum: interaction among tools, processes and materials, and the effectiveness of their use in design.
2. Usage: effectiveness of using design as a way to protect the user's body, and a symbol of its uniqueness.
3. Conscious planning: design is contemporary and reflects the level or conditions of society.
4. Need: need is related to survival, identity and the formation of goals, as clothing must meet one type of need at one or more of these levels.
5. Aesthetics: the formal aspect that characterizes the design to achieve its function.
6. Interconnection: design interconnectedness with consumer values and culture.

### **Producing sustainable design within the framework of consumer requirements:**

Structural elements of material, texture, shape, and accessories, formed through their interconnectedness with each other, and with the environment surrounding the user; identity and exclusivity, which raises the level of social communication for the design, and clothing designs interact with the user's movement. Proposed apparel designs should not hinder user movements, using loose or open design, or openings that take into account ergonomic elements, in addition to the nature of the materials that provide physiological comfort. Thus enhancing the value of social sustainability of the designs implemented, and each design was implemented based on a set of determinants of sustainable design reference, from the interaction of colors and materials, and the impact of each of them on the user, while also taking into account aspects affecting consumer preferences.



**Figure 2**  
1<sup>st</sup> design after production



**Figure 3**  
2<sup>nd</sup> design after production



**Figure 4**  
3<sup>rd</sup> design after production



**Figure 5**  
4<sup>th</sup> design after production



**Figure 6**  
5<sup>th</sup> design after production

## Results

- The research confirmed the effective role of the design stage in directing the apparel industry in the Egyptian market towards achieving sustainability.
- The application of sustainability in the design of apparel requires a study of the economic, environmental and social dimensions.
- Sustainable design is based on conscious specifications, working to meet the needs of the consumer within the framework of the quality of apparel on the functional and aesthetic level.
- Designer can define the approach that the concept of sustainability seeks, and influence all levels and stages of the apparel industry.
- Designing apparel has an important sustainable dimension, which is its functional quality on the one hand, and aesthetic on the other.
- The value of apparel for a consumer affects his consumption pattern.
- Sustainable design of apparel achieves high-quality consumer standards, thereby reducing chances of disposal.
- Real awareness of the concept of sustainability contributes to determining the importance of sustainable design and its effectiveness in reducing resource consumption.
- Sustainable design has become a global trend and it is spreading, therefore it must be placed among the priorities of the apparel industry in the Egyptian market.
- The inclusion of sustainability in the apparel industry has become a necessity more than a kind of luxury.

## Resources

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