

An Exemplary Project for the Sustainability of High Design Value Added Products by Using Textile Wastes

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ABSTRACT : With this article, the presentation and analysis of a project that can be recycled (re-used) with a low probability, can set an example for the textile and clothing production sector, and even enable the transition to alternative design and production applications will be made. Re-evaluation and open to examination; In addition to the textile design sector, it also has comprehensive aims such as attracting the attention of occupational groups, which using the same materials. In order to solve the textile waste problem, which has been proven to negatively affect all environmental problems, applications for mass production have been started in the sector. Since the initiatives could not provide the expected high profitability of recycling, this approach cast a shadow over the waste recycling, reuse and recovery activities. It makes it easier for waste materials to be classified as mostly garbage (landfill) due to the troublesome of implementing difficult new production methods.

It is aimed to create a net production-consumption chain in which the concepts of environmental-friendly, organic and slow fashion are placed with verified examples, aiming to produce high value design products from raw materials that are regarded as garbage. With this project, which aims to place the concept of “Design” in the alternative lifestyle and experimental production methods offered, attention will be drawn to the appreciation of waste materials as a raw material source. In this publication, fieldwork, evaluation of oral history outputs and analysis of individual production examples that the designer has applied in the past are carried out as main methodologies. In the fields of “Culture, Memory, Tradition”, it is not only aimed to revitalize; In addition, it is thought that the studies will emphasize the richness of the dress codes that signify cultural identities.

KEYWORDS: Design Added Value, Eco-Friendly/Slow Fashion, Recycling, Sustainability, Textile Waste.

I. INTRODUCTION

Statistical data in reports from environmental and global warming-themed studies shared in recent years; It proves that wastes from textile and clothing production methods are not environmentally friendly and cause waste in large-scale consumption of raw materials (Mc Kinsey Report, 2016).The results show that after their very short usage life, the garments are either disposed of as landfill or recycled into products of low economic value, such as insulating material, wiping cloths, bed stuffing, or even carrying blankets. On top of all these factors, it has been proven that half of the clothes produced with the “Fast Fashion” factor are thrown away in the first year. Population growth and variable fashion preferences also accelerate consumption, resulting in more waste. It can be observed that the lifespan of the clothes, which are not repaired and renewed, is getting shorter due to the inability of individuals to be self-sufficient and moving away from the concept of “Timeless Labour” (Atalay, 2019). Decrease in natural resources and changing social values and lack and deprivation caused by lost hand skills have created the search for personal information seeking (Polanyi, 2005).

STRUCTURING THE TEXTILE AND GARMENT PRODUCTION PROJECT WITH ADDED VALUE DESIGN WITH A “ZERO WASTE” APPROACH:

Since these new products, which are produced by circular economy-based textile waste collection and then mass-produced and released to the market, especially produced by small-scale manufacturers without design and product development concerns, do not fulfill expected profitability; This has caused recycling and waste recycling activities to be viewed negatively. Although all different collection methods have similar strengths and weaknesses, the most crucial point of the operation is the separation of the collected waste and its collection in consistent amounts in a continuous order (Chavan, 2014). Among the textile wastes that we can

classify in three main items, the most laborious and costly collected industrial textile wastes are excluded from the scope of the project.

Pre-Consumer Textile Waste: Pre-consumer textile waste, production waste from processing fibers (natural or synthetic), yarn and textile waste;

Technical textiles, non-wovens, clothing and shoes are all production wastes obtained from the process of production. In addition, many salable-size wastes such as waste edges generated during production, shearing waste, rejected materials (not suitable for production) and defective clothing are generally “clean waste”.

Post-Consumer Textile Waste: Post-consumer textile waste includes examples of any type of clothing or home textile (such as sheets, curtains and towels) that the consumer no longer needs and decides to discard because it is worn, damaged, or getting old, out-of fashion products could be classified and evaluate under this group. This category consisted of reasonable, quality clothing that could be recovered and then recycled by another user, usually as second-hand clothing sold to third world countries. Clothing that cannot be re-worn; It is broken down into fibers for use with products similar to those produced from pre-consumer textile waste.

Industrial Textile Wastes: Industrial textile wastes are the residues of commercial and industrial textile applications such as health wastes, in addition to high-volume commercial wastes such as carpets, curtains, and industrial applications such as filtration, conveyor belts. Collection and chemical contamination issues make this category the most difficult to recover. A significant part of these products are incinerated or thrown into landfills.

PROJECT FORMATION PROCESS: The ease of collection of waste created by the researcher through suppliers and manufacturers, which he gained from his long-term different sectoral experiences, has turned into a gain for the benefit of the project. In particular, the supply of pre- or post-production wastes of fabric and clothing sorted according to fiber types; It is thought that the project will gain continuity by improving the experimentalism. As Robert L. Peters puts it, “Design creates culture. Culture shapes values. Values determine the future”. In the process of realizing this project, which can bring environmentally friendly solutions by adding value to zero waste textile and slow fashion production with the design element, the experiences gained as a designer producer (manufacturer) in an individual slow fashion brand contribute (Kipöz, 2020, p. 191). Considering timeless elegance and functionality at the same time, design and production are carried out with a holistic approach to clothing made of fiber and experimental studies (Kipoz, 2020). It is a traditional method to separate the fibers and select the material according to the product with the aim of making optimum use of the local wool, but it is rapidly losing its masters today (Picture 1).



Picture 1. Classification of shredded fleece in accordance with production purposes. Turkey: Afyon, 2001.

With the special products produced by the practicing designer/researcher in limited numbers with design-oriented works, this project sets an example for the new production actions created by the concepts of “Slow Fashion and Sustainability”, which have become widespread in the last fifteen years with social movements.

“Reminders” Different Production Methods from the Past: In this section, a field study has been completed with quotations from family records and oral history as a research method. The details in the modular production process of the researcher designer's core family and close environment can be considered as a preliminary study that can be a solution to current problems.

In the city (Istanbul urban/regional culture) life of 1935-1940, it was common for adolescent girls to be sent for apprenticeship to master adult women in their neighborhoods so that they could improve their manual skills and contribute to the home economy. According to the information obtained from the family records, it is thought that even if the young girls are successful in school, they can be fully prepared for life with these practices in addition to their education (Tuna, 2015) (R. Selmin Gürışık, Oral history record). In addition to the experience of hand knitting, crochet and sewing, women in daily life; they gave contemporary home-economy practices that would revive the recipes of embroidery and locally traditional dishes from the past, they also enabled the women of the future to set an aim to develop self-confidence. Thanks to this functional system, the recycling of clothes such as sweaters that are disassembled and re-knitted, shirts with inside-out collars, repaired socks, gloves and hats are ensured through continuous jigsaw renewal practices. More environmentally friendly, social and ethical where all wastes are evaluated; A conscious production-consumption system was being tried to be established. With the awareness placed within the framework of this mechanism, the awareness of solidarity and support to the group has been developed. With the awareness placed within the framework of this mechanism, this higher consciousness of solidarity and support to the group has been developed. In particular, the motivation to equip against the material shortages of the young Republic has accelerated these movements.

Attempts made with the use of new materials are also encountered. Hats, booties and jackets that will be embroidered baby dowry produced by the designer, who realized the practices in this study, created job opportunities for the women in the neighborhood with the group founded by his aunts living in Niřantaşı Teneke Mahallesi in the 1960s, are among the information obtained from the family sources that they sold in Beyođlu Stores. Children's contributions are also seen in works such as cord making and cord threading (Sevim Ger, Oral history record). There are many examples of the economic evaluation of the handicrafts that come from the traditions of the ghetto-town residents with the cooperative spirit, the relationship and solidarity of women's groups. In addition, these formations, which we can consider as an exemplary behavior for lifelong learning and personal development, have even deeper and more sensitive social dimensions. We can consider it as an important social behavior that leaders try to bring them into the group by taking care of the weak link of the chain, giving them appropriate and personal skills development jobs. In addition, with the concept of “Daily Tailor”, they are transformed into new costumes with different models from existing old clothes by applying a jigsaw puzzle method with daily or a few-day gatherings at homes; or reuse of old fabrics in crates; can be cited as examples of clothing pollution and waste reduction. The transformation examples of the Old-New concept have passed into our cultural heritage (Atalay, 2019, p. 61 – 76). In fact, it can be observed that with the proposals of “Use Local Goods” in the society, it is tried to establish a consumption-model with a balanced exchange in the relationship between the individual and the material, with the established practices starting from primary education.

Anna Brismar's “Green Strategy” principles and sustainable fashion practices have created a foundation that will form the infrastructural base for the “Zero Waste Project”. Combining experiment with theory, accepting design and production as intertwined experimental activities, and aiming to progress according to the data obtained, this research methodology is one of the main practices of the project. Since it creates awareness with its self-learning method, it has created a special learning and teaching environment (Isaacson, 2019, pp. 170 - 175). When experiences are not abstracted from nostalgic and romantic approaches, the extent to which these early practices played an active role in the formation of designer-producer identity is reflected in the products obtained as a result of the project. It can be said that the theory-based practice-based research method is the main methodology of the project.

Analysis of Personal Studies and Data Collection: The sustainability approach of the researcher in design practices from the past, creating new materials and using them in applications, being one of the tried methods, contributed to the foundation of this project. Cutting the wastes of leather and suede clothing production and obtaining material that can be knitted by wet-stretch finishing method, producing hand-knitted sweaters with yarns produced as shoelaces and twisting wastes formed in the yarn production process are among the experimental activities of the researcher. Hand-painting, batik and applique-embroidery methods are examples of applications in the same parallel with the designer's use of natural materials and the use of the idle labor force of housewives. In addition, it can be said that it is an example of the first accepted / verified products of the fiber and Wearable Art movements. This process, which started with Ali Tara, who is well-known for his creativity and pioneering commercials, and Lale tara, the production supervisor, enabled the designer to move into the fields of art-direction and decor-costume practice. Afterwards, in the first Fashion Fair held in 1994, as part of the promotional fashion show of the Apparel Sub-Industry Products Association;

Before the concept of wearable art entered the literature, an example was set with the collection produced with the use of zippers, buttons, snaps and interlinings. After experiencing industrial technological production methods; The tendency of the designer-maker to work by hand and using only natural materials in the productions carried out as an alternative deviation has been a professional choice and his experimental practices continue in new projects. Experimental natural fiber fusion, bases obtained with a mixture of woven and non-woven surfaces, and structural decorations with special twisted yarns on it are seen as applications that are used beyond decorative purposes with the works of the designer's seamless dresses series, which are carried out in line with continuity (Picture 2).



Picture 2. The preparation stage in the production of seamless dresses, which is carried out in two dimensions by considering three dimensions.

Examples of the transformation of texture and surface works created with various yarns from different fiber mixtures on woven fabric surfaces seen in Picture 2 into seamless clothes by wet wool felting are shown in Picture 3.



Picture 3. Different Examples of Seamless Dresses.

When obtaining seamless dresses, first of all, folding is made in accordance with the desired form and joining is made by felting instead of sewing. Afterwards, the collar and front part are cut and transformed into a caftan form, as is done in the production of traditional unbuttoned (*yakası açılmamış*) garments. The designer did not use waste material in the implementation of the first trial project. Afterwards, it continued its production with the waste wool materials obtained from the production of top-top fabrics, twisted waste yarn, hand-knitted wool, wool under the comb that was shed during the combing and discarding of the wool, and defective tops. Afterwards, it continued its production with the waste wool materials obtained from the production of top-top fabrics, twisted waste yarn, hand-knitted wool, wool under the comb that was shed during the combing and discarding of the wool, and defective tops. These seamless dresses, designed mostly for experimental purposes, are in models adapted from the traditional production of *Kepenek*¹ (Picture 4).



Picture 4. Example of a seamless dress inspired by the shepherd coat (front and back).

In the application shown in Picture 5, clipped floss yarn, staple fiber and yarn twisting machine waste hand knitting wool were used as material. During the process of preparation, the designer created a floor with floss yarn and staple fiber, and then made an impromptu drawing on the background with hand knitting wool.

¹*Kepenek* is a shepherd's coat that is formed while being felted by the traditional way of seamless folding. Depending on the regions, different applications such as sleeved, sleeveless, hooded and unhooded are encountered. Also the patterns and initials of the artisans are all signify the exclusive labeling...

While providing the formation of structure with the drawing method, coupon fabric was produced by bringing aesthetic solutions. This experimental garment was created by cutting and sewing a fabric formed by felting multi-layer surfaces.



Picture 5. Fabric is made of Viscone/Rayon yarn and then garment produced through cut and sewn.

In the first applications, due to the difficulties in the precise harmony of hand dyeing wool, fiber and fabric colors and primitive technological conditions, the dyeing method of garment-clothes dyeing was chosen. Production support was obtained by contacting the companies deal with wool dyeing without extra feltibility and heath controlling issues; in the sector, paralleling together with the experimental trials. Afterwards, applications were carried out to obtain wanted different results according to the main color of the material.

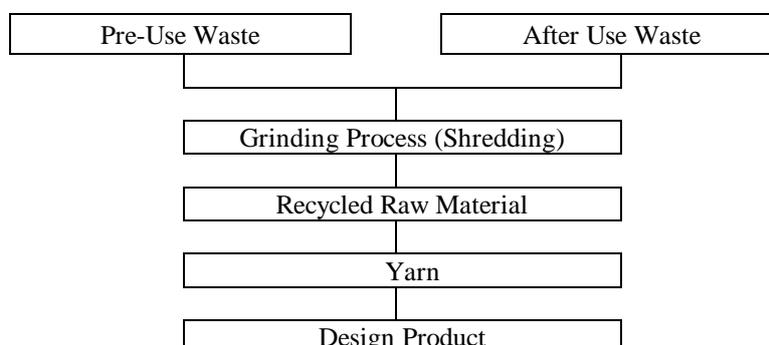


Picture 6. Experimental clothing made of waste materials, colored with the piece/garment dyeing technique.

The experimental clothing sample shown in Picture 6 was colored with the piece/garment dyeing technique. Ecrú cotton-linen production waste piece of fabric as a base/back ground patterned through using fiber-material obtained from shearing waste silk swatches. The structure was formed by fusing (sticking) the layers to each other with the wool felting method. In this example of a seamless dress, tone-on-tone integrity, which gives the targeted harmonious result, was obtained by separating the silk waste scraps in close coloring-tones and using all other materials in raw/ecru tones. As a result of the experimental studies, optimum positive results were obtained, so it was decided to create a “Zero Waste Project” that will keep the design element/aspect as a priority in the foreground. Within the scope of the project, necessary planning and analysis were carried out on material supply and production.

Looking at Table 1, which shows the process starting with waste classification, the expressions “Pre-Use Waste” and “Post-Use Waste” are encountered. Waste before use; it covers all kinds of wastes such as under carding machine, yarn twisting waste, fabric weaving waste, rolling-up fabric (fabric roll winding head waste), which are formed in the process from raw fiber to fabric production. This type of waste is usually the materials that fill the garbage in the sector and have a difficult place in the recycling chain.

Table 1. Production process from waste to product with added design value (Table: H. Selçuk Gürışık).



Post-use waste is clothes that have expired due to various reasons such as worn out or bored, out of fashion. After the supply of raw materials, the collected materials are cut, shredded and blended to prepare for the grinding process. The “Grinding Process” is the stage where the basic mixture is created by breaking all fiber differences. At this stage, new structures and transformation are provided with the demolition/amalgamation

process. In Picture 7, the machine used in the grinding process on a sample basis with the aim of recycling the production waste of Sari silk fabrics in India, with a similar purpose to the project approach, is shown.



Picture 7. Small capacity (for sampling) textile and garment grinding/shredding machine.

At the “yarn” stage, sample yarn (disintegrated/shredded) with various characters and visuals can be produced by hand-twisting the oakum material. It is thought that the experimental working environment can give an idea to innovative approaches, especially in hand knitting wool and yarn designing, which has no priority in the textile and fashion sector. Yarn design will provide services to various consumption areas, providing products with high design and aesthetic value as well as mass production oriented products. In the title of “Designed Product”, which is the last stage of the project, the production of the material designed with high design added value materials created with the philosophy of reuse is carried out.



Picture 8. Conversion work by felting denim wastes and wool fiber together.

Within the scope of the project, studies were carried out in which not only the ground material was used, but also directly used in waste ready-made fabrics in accordance with the design. Picture 8 shows the designer’s placement on a wool fiber background with pieces of waste denim fabric. In this study, a patterned outdoor-clothing (rather heavy weight) fabric was obtained by felting the layers. This new woven and non-woven fabric blended with cotton and wool will set an example for waterproof fabrics with product development studies.

II. PROJECT DEVELOPMENT MOVEMENTS WITH DESIGNER, UNIVERSITY AND INDUSTRY COLLABORATION

In 2017, the designer was invited by Robert Burton, head of the Department of Textile and Fashion at Teesside University, and continued his project work. During his visit, he introduced and developed his project with workshops, seminars and trying to put a collection of experimental art and design objects. The raw materials used within the scope of the study were selected from waste materials by adhering to the philosophy of the project.

In the ongoing process, the designer participated in the exhibition “Gift 2”, which was held in partnership with Teesside University Textile and Fashion Department and Marmara University Textile Department. Within the concept of the event, the artists conveyed the waste materials to each other with the gift waste evaluation approach, which is also named after the exhibition, and then realized applications with these materials. Participants were exhibiting at Marmara University Faculty of Fine Arts.



Picture 9. H. Selçuk Gürışık, Gift 2 Exhibition, Examples of experimental clothing.

Zuhal Kuvan-Mills, the organizer of the Green Embassy in Australia, featured and exhibited the designer's experimental garment work (Picture 9, sleeveless garment) exhibited at the “Gift 2” event during the “Organic and Eco-Friendly Fashion” week they organized. Examples of such movements in the USA and Europe can be multiplied. With the certificates given, the sustainability of the products is proven and the commercial activities for sale will continue and will be developed. Technical analysis offers opportunities for those who are interested in this subject and who are looking for application areas. The which they specify in shaping sustainable fashion.

It proposes applications that will be defined as minimal cutting at the stages of tessellation, jigsaw, and embedded jigsaw reality of the movements that come out of life and become intertwined with it in life is undeniable. With their design suggestions based on different cutting(production) practices, Rissanen and McQuillan describe four different methods in their Zero Waste Clothing Design book, and multiple fabric usage, as well as cutting and marker placement (2018).

II. CONCLUSION

This article aims to add value to the design, deals with the formation and development processes of the project, which started with zero waste. It aimed to transform the approach into a movement, to take place in life practices, and to bring and transfer the data obtained from personal experiences, emphasizing the necessity of ignored design/aesthetics. The slow, organic and sustainable fashion sections within the concepts of the project operates in very wide and realistic areas. However, while the concept of sustainability is kept in the foreground, examples are frequently encountered in current approaches where design and aesthetic concerns are kept in the secondary levels and background. With the awareness of this current situation, the project, which is the subject of this article, was developed and examples were presented with experimental studies. Although the final product is created in the form of clothing within the circle of the project, the study does not only cover the areas of clothing and fashion. By detailing the way, the project was handled and its process, in wider areas;

Innovative examples are included with the sustainability approach in yarn design, hand knitting wool and hobby handicraft materials. In addition, this whole process aims to support the survival of the concept of culture that will reduce the erosion of use of the universe with ethical/environmentally friendly approaches. The experimental work process started with sub-cultural activities and over time became a part of popular culture and turned into movements that were accepted by the masses. The waste recycling project is seen with different approaches in every art and design practice and in various disciplines. All of the fictional and subjectively visible outputs; can be considered as experiments supported by facts based on theory and technology. The project process, art and design movement is not carried out only with individual impulses; It also analyzes an example of the reality in which genetic memory and cultural geographies reflect the different effects of aspects (colours). In order to sustain all these movements, to increase the future initiatives, the project aimed to set a precedent by opening the examples from the past for evaluation, to make the initiative more realistic and livable (strengthening) by placing it in the contemporary living culture. It is thought that the evaluation and updating of the results of the field study, which consists of retrospective, family and close circle memories, adds another useful perspective to the traditional to contemporary discussions.

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