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Traditional Indian Textile Techniques Used to Upcycle and Recycle Textile Waste

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Article

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ABSTRACT

The current study focuses on reviewing different traditionally practiced Indian textiles techniques used to upcycle and recycle textile waste, including fabric waste, rejected garments, used garments and fabrics, finished and processed textile products and other kinds of hard textile waste. The findings reveal that many artisans, weavers, craftspeople, self-help groups, and fashion and textile designers from different Indian states are practicing many traditional textile techniques to recycle and up-cycle textile waste. Among these techniques, the famous techniques identified include Kantha of West Bengal, Sujani of Bihar, Kathputlis of Northern Indian states, Panja Dari of Haryana, Namda and Gabba of Kashmir, Kausti of Karnataka, Patchwork and Chindi Rugs. There exists a strong need to make people aware of the methods of recycling textiles that not just increase manufactured textile product life cycle but also contribute towards a sustainable future of the fashion and textile industry in a developing country like India. It has been observed that these techniques play a crucial role in converting textile waste into creative functional products, thus silently contributing to the sustainable future of the textile industry. The objective of this study is to summarize and publicize the methods of these traditionally practiced Indian textile techniques used to recycle and upcycle tonnes of textile waste produced every year. It was found that these traditionally practiced recycling and upcycling techniques of various Indian states are contributing silently to the sustainable future of the Indian textile industry. The recycling of old cloth not just increases the product life cycle but also provides employment to millions of people.

KEYWORDS

recycling waste, traditional textile techniques, upcycling, fabric waste

INTRODUCTION

The traditional Indian textiles are among the finest textile traditions in the world. The Indian subcontinent is known to the world for its diversity in rich art and cultural heritage. It was found that during 2500 BCE, Indian crafts and textile products had been exported to many contemporary

civilizations, such as China, Mesopotamia, and Egypt, from Mohenjo-Daro and Harappan civilization based on the evidence of archaeological excavation. These textiles were made from various types and varieties of fabrics using different manufacturing techniques, like knitting, weaving, and numerous surface-embellishing methods, to add aesthetic value along with dyeing, printing, and embroidery. The craftwork depicts the richness of cultural heritage during fabric manufacturing and embellishing fabric surfaces through motifs inspired from the surrounding flora, fauna and culture to incorporate uniqueness into each of the crafted textile products. Therefore, it is also necessary to protect the traditional culture and the expertise in order to maintain the identity of local communities [1,2]. The increasing demand for traditional craft products worldwide suggests extension prospects for both local and foreign handicraft producers. The influence of handicraft developers, as well the climate and their lifestyle, is traditionally visible [3,4]. The handicrafts are the everlasting emblems of society. India is an ethnically diverse nation, a cultural centre, and a unique place for craft practices. Furthermore, the handicraft industry extends across the world through both urban and rural areas. It is an extremely labour-intensive cottage-based decentralized industry, portraying the Indian way of life that is fond of aesthetics, tradition, and sculpture. Indian artisans, weavers, craftsmen, and textile designers have always been appreciated for using natural environment-friendly ingredients. The artisans manufacture various items that reflect their imagination, flavour, and craftsmanship. Handicrafts are as varied as the Indian communities. The Indian traditional art and craft include several kinds, such as paintings, ceramics, home accessories, fabric making, needlecraft, and ornaments, with delicate designs, motifs and many more. Indian textiles and crafts are known for their traditions, such as poetry, dancing, music, sculpture, architecture, carpentry, metalwork, craft, painting, and embroidery. The government of India has developed craft centres by launching different schemes in different district clusters to contribute to rural growth because the craft sector is the most significant contributor to the origin of jobs and export earnings in the Indian economy [5,6].

The emphasis on environmental responsibility, public policy interests, and proactive recycling promotion have contributed to increased efforts to reduce the amount of textile waste sent by the customers to waste sites, and the expanded emphasis on textile recycling can improve textile sustainability. Textile recycling is a way to maintain the durability of textiles. Disposal of textile materials takes several years and, throughout this period, it supplies our environment around the globe with contaminated gases. That is why people have needed to recycle clothes. There are several ways to use recyclable clothing [7]. Nevertheless, the resources used to manufacture the items also discover five various ways to recover the product – by repairing, reusing, refurbishing, remanufacturing and recycling. The craft product is also made from high-quality, recycled products, which improves the product's lifetime [8,9].

Thus, the term recycling represents the cloth that is reprocessed and converted into new goods. For this reason, recycling is an ethical approach to consumerism with environmental and social responsibility. Each state of India has its indigenous regional art and culture. Regional textiles have their different manufacturing processes and methods [10-12]. There are many traditional textile techniques for recycling textile waste consistently practiced in different states of India. The folks of different states have been practicing various traditional textile techniques of recycling textile waste in order to convert used fabric and garments into entirely new products for generations. Many of the traditional textiles of India impersonate an essential function toward recycling the old fabrics. Fascinating great examples are Kantha from West Bengal, Panja Dhurrie from Haryana, patchwork and kathputli from Rajasthan, and Sujani embroidery from Bihar, while certain traditional textiles are using antique fabric and executing the beneficial products.

The current study is an attempt to review the recycling of old clothes and apparels using various traditional textile techniques that are contributing in converting millions of tons of textile waste generated every year into useful new products. The fashion industry periodically generates lots of textile waste, such as rejected or second-hand quality garments, old cloths, fabric hard waste, partially torn clothing, textile testing labs waste, and numerous other types of apparel sector wastes. The traditional textile techniques convert aforementioned textile waste into reusable products by improving aesthetic features through different techniques for an improved market potential. The products manufactured by using old cloth or using other textile waste fabric includes carpets, uniquely embroidered fabric, durrie, mats, kathputlis, table cloths, and handbags.

THE TRADITIONAL INDIAN TEXTILE TECHNIQUES USED FOR RECYCLING FABRICS

In almost every Indian state, there exists at least one technique of utilizing old fabric or reusing textile waste used for making some new products through different surface embellishment techniques. Some among them are discussed below, including Kantha embroidery, Sujani embroidery, Panja dhurrie or durrie, Kasuti embroidery, patchwork, Chindi rugs and Chakhlo, and kathputlis.

Kantha Embroidery

Kantha is the most prevalent and oldest traditional embroidery of West Bengal [11]. It was observed that teenage women were taught to embroider Kantha at an early age and, with time, they procured varied types of practical skills in a form of education. On the foundation of these skills, they learned to see the world full of beautiful tiller (plants), leafage, bloom, and animals, with the help of drawing and needlework on every product. Additionally, the women of West Bengal have often utilized the Kantha embroidery to express their visualization on fabric through their embroidery skill, inspired from their

surroundings and culture. In Kantha, embroidery has involved a simple run stitch. In this way, the embroidery has been made extraordinary [12]. Kantha signifies each construction by recycling worn-out cotton sari or dhoti. The women of West Bengal take old saris or dhoti, and then in the view of arranging the layers of fabric, embroidery will be done with the multi-coloured threads and women compose the patterns on the layers of fabric using different motifs inspired from their day-to-day life and culture. Traditionally, it is necessary to have five to seven saris to build up the full-length of Kantha. In addition, the fabric is then combined to a predefined acceptable breadth and the layers of material are then laid on the ground one on top of another and, following that, embroidered with multi-coloured threads [13]. The technique uses old clothes to produce Kantha embroidery and a new product can be developed through the upcycling of old saris. Hence, this results in increasing the product life cycle and contributing slowly to a sustainable future of the fashion and textile industry in India. The most popular motifs being used by the craft women of West Bengal for embroidery are scrolls, sea monsters, crackers, mammals, birds, fish, ships and lotus flowers as well as many of the domestic objects, like lamps, pitchers, nutcrackers, umbrellas, musical instruments, and human figures, including gods, deities and fisherwomen as shown in Figure 1 [14].

Figure 1. Kantha embroidery using running stitches on old sari [14]

In Kantha embroidery, the base fabric is often blue, yellow, red, white, turquoise, or green, and also the layout of the texture is typically navy blue, either stuffed among the stitches filled with tantamount

colours or different colour stitches that have been referred to as the Do-Rukha. Kantha embroidery is proposed to revolve the worn out, older clothes and customize other attractive products. The craftspeople can effectively recycle the fabric, and by using Kantha embroidery, produce daily useful items. India has a rich heritage of embroidery, and the traditional style of Kantha embroidery is well known [15]. Hence, Kantha embroidery is an effective way to upcycle old saris and clothes to make attractive new products with improved market potential due to its uniqueness.

Sujani Embroidery

Sujani is an age-old technique of Indian state of Bihar that was associated with needlework. It is an anecdote of women from Bihar. A Geographical Indicator (GI) for Sujani embroidery was obtained in 2006. The government of India has included Sujani embroidery into various schemes of traditional crafts along with recognising it as a GI. However, this craft has been characterized as a labour foundation in a profound method in which consolidates undyed or dyed textiles of either sari or dhoti. The craftspeople take old garments that have become soft after a long period of wearing and washing and cut the fabric into pieces and then utilize the recycled yarn from the garments that were rejected. Craftspeople have embroidered with a thread of similar colour as the base fabric and, chiefly in Sujani embroidery, 105 to 210 stitches per square inch are completely dependent upon the embroidery fineness of the work. Sujani is similar to the West Bengal embroidery Kantha, but sometimes Sujani fabric is much broader and coloured. Whenever a piece of fabric starts to rip upon ageing, people never throw this, rather they remove the torn fabric from the borders and attach extra several saris toward the fabric boundaries. Then, the layers have fabric boundaries stitched on by using a thread and needle. Craftswomen make attractive quilts and then stitch fabric with simple running stitches until an exquisite embroidery made of small stitches is covering the whole fabric surface [15].

Figure 2. Sujani embroidery motif [14]

According to Finn, females of Bihar had adopted the Sujani embroidery because it manifested their recollections, oppression, and authenticity through Sujani stitches. While some of the significant motifs were used in Sujani embroidery in the earliest days, which signified spiritual, natural, and everyday impulses, nowadays the motifs represent specifics about the rural presence, the ethos of Hinduism, and societal challenges, for example electoral crime, women's education and household destruction scenes, which are predominant, shown in Figure 2. In addition, at present time, many messages are represented on textile by using the Sujani embroidery stitches. For instance, health care, the environment, and women's struggle for their rights. Hence, this embroidery technique is practiced by the peoples of Bihar to rejuvenate old fabric or clothes into reusable products through fine needlework.

Panja Dhurrie or Panja Durries

Haryana is renowned for her amazing heritage of handlooms, durries or dhurries, shawls, and capabilities. The creativity of the artisans of Haryana can be easily seen in their magnificent artworks and hand embroidery, but Panja Dhurrie is an intimate product. Dhurrie is produced by approximately every family in the villages of Haryana, mostly practiced by housewives as a recess time activity. The word "panja" in such dhurrie products derives its name from a metal claw-like device called "punja", which is how local communities pronounce "a beat". The Dhurrie is constructed on top of a four-sided frame, and this 'frame' is usually made of metal. The length of that frame is more formidable than the similar width of the rectangle.

Moreover, the 'frame' plays a significant role in developing dhurrie. The yarns are established on the entire upper part of the frame on the longitudinal axis. After that, the women cut the fabric into strips and then begin to construct a dhurrie. The process of building a dhurrie is done on the entire upper part of the frame, moving from left to right, and right to left.

In the rural areas of Haryana, panja dhurrie is constructed by using the wastes of fabric or clothes. The panja dhurrie was constructed during the olden times by all the women living in the villages of Haryana during their free time. Women would first cut the fabric into panels and then produce a dhurrie with the fabric strips. In this method, mostly cotton-blends and hand-spun and hand-woven khadi materials are used in the production of panja dhurrie. The motifs that the craftspeople use in this handicraft manufacturing process are mostly geometric patterns, flying birds, and, often, human characters, as shown in Figure 3.

Figure 3. Geometric pattern on panja dhurrie or durrie [16]

The dhurrie can also be constructed using basic weaving from various kinds of textile materials such as silk, chiffon, satin, polyester, nylon, and cotton textiles. Hence, the textile artisans recycled different types of fabric waste to construct the dhurries or durries using different weaving patterns to produce reusable products.

Kasuti Embroidery

Kasuti embroidery of Karnataka state is globally famous for its unique characteristic features. It distinguishes itself because of its bizarre peculiarities, and some areas in the Karnataka state are popularly associated with Kasuti embroidery, namely Bijapur, Belgaum, and Jamakhandi. This embroidery is invariably constructed by calculating the number of threads. It has adopted four varied

types of stitches, including Menthi, Gavanthi, Negi and Murgi. Menthi stitch is used to give a heavier look to the fabric. Gavanti defines it as a kind of a double run stitch implemented toward creating numerous variations of lines. Negi, a simplistic running stitch, creates a weave-like effect and the zigzag type of a stitch is known as Murgi. Moreover, in Kasuti embroidery, the pattern embroidering work is very intricate and inspired by periodic objects, culture, and nature-related elements, like geometric patterns, birds, mammals, lords, goddesses, synagogues, residences, and bullock, as shown in Figure 4, along with reflecting distinct moments, such as a bridal sari fully covered with golden and silver threads for the wedding day. The motifs used to depict imagination on the sari are related to nature, periodic life, geometric patterns, and these motifs necessitate embroidering on the sari. Therefore, motifs are marked with charcoal and pencil on the fabric.

The Kasuti embroidery is mostly done on hand-woven fabrics of darker shades, usually black shaded ones. For embroidery on the cotton, yarns are dyed with versatile pigments, including red, orange, purple, green, yellow, and blue. The craftspeople also use sticking threads to produce the Kasuti embroidery. Moreover, embroidered yarn is collected from the exclusive boundary of worn-out silk saris [17].

Figure 4. Motifs used in Kasuti embroidery

This technique utilizes the worn-out silk saris boundary yarns for the manufacture of Kasuti embroidery, and the artisan completely recycles the border of a sari for further use as a sewing thread to depict motifs. The emphasis is to recycle, especially the boundaries. Kasuti embroidery is done on costly saris to improve their life span and other textile items, such as a woman's blouse and child bonnets. Nowadays, fashion accessories and other products are also embroidered with Kasuti

embroidery, like curtains, purses, mobile covers, belts, bedcovers, and cushion covers. It was found that, for producing Kasuti embroidery samples, a person needs lots of patience, dexterity, and intricacy. Kasuti embroidery is primarily a business for many women in the village and a source of revenue [13,20]. Thus, the Kasuti embroidery plays a crucial role in reviving old cloths, fabric and particularly saris to add value to old things.

Chindi Rugs and Chakhlo

Several varieties of rugs are constantly being identified in many states of India. Among the others, Chindi rugs of Gujarat gained popularity with time, not simply because the technique recycles older textile waste, but also because rugs are cheaper at the same time. In the local language, “chindi” means “cheaper”. The craftspeople of Gujarat have constructed recycled rugs using older fabrics, clothes, torn out cloths, and other textile waste [18,19]. However, in Gujarat, Chindi rugs represent an expression of a traditional woven attire in which the craftspeople cut the fabric into one- or two-inches wide strips and then attach them together by stitches with a hook and a thread. Hence, the rugs are manufactured by this process and these mattresses and floor carpets are renowned as Chakhlo rugs or Chindi rugs by the communities of Gujarat. In these rugs, the motifs used by the members of communities are geometric figures, as shown in Figure 5.

Figure 5. A Chindi rug (left) with a multicolour pattern and a Chakhlo rug (right) with geometric shapes [20,21]

After converting waste fabrics into Chindi and Chaklo rugs, they look varicoloured, because they have been developed by lots of waste fabrics of different colour. Hence, it can be said that Chindi and Chaklo rugs play a significant role in recycling the fabric waste into useful doormats and floor carpeting.

Namda

Namda is a traditional handicraft practice in the Indian state of Kashmir, and some of the centres of Namda rugs production in present-day Kashmir are Murree, Rawalpindi, Lahore, and Peshawar. However, the artisans of Namda rugs were from the Mansuri Sama community. The multicoloured floor-covering rugs are made up of cotton and wool fibre, which are additionally compressed into a variety of magnitudes and are rather inexpensive. It was observed that the price increases with the increase in the proportion of wool [22]. Namda is mainly made from sheep's wool. Namda is manufactured with the cheapest and worst quality of wool. Kashmiri people are blending wool fibre in a predetermined proportion with cotton fibres, as it is necessary for producing Namda rugs.

Figure 6. Floral motifs using multicoloured threads in Namda [16]

Kashmiri people first processed the wool by scouring it and then it was inflated. Afterward, the wool substance finishes with the help of the Painja. The Painja is a kind of an instrument utilized for beating and stuffing a considerable quantity of wool. It is a wooden apparatus that seems comparable to a large longbow. Then, the fluffed wool is piled into a broad burlap textile of the necessary dimensions. Thereafter, the fringes are fabricated through the isolated tufts of fleece along the edges. Saponaceous (soapy) water is dabbled (sprinkled) over the vast area of wool. Later, the wool is rolled and kneaded until the layer of wool is not felt. Then, Namda is soaked in a giant pitcher of water. Finally, the fleece

is kept flat on the ground so that it dries in the sunshine. These methods are still primitive, and Kashmiri communities assume that a similar technique has been utilized in prehistoric times.

There are two varieties of Namda, one of them is entirely embroidered, and the other is most simplistic. Still, generally, fragmented designs are processed to practice chain stitches, and Namda is embroidered with a tremendous flowery pattern that historically clarified the Kashmir Valley-like visibility. Furthermore, these carpets are glowing and vibrant, including the traditional horticultural design from the Kashmiri gulch. This is the warm, eccentric and inexpensive flooring that is frequently used for the colder periods [23].

Kathputlis or Puppetry Art

Many styles of puppetry exist in India and they can be mainly classified into four categories: string puppetry, rod puppetry, shadow puppetry, and glove's puppetry. In a northwestern state of India, Rajasthan, craftspeople have utilized the puppetry in a general way. The puppet or Kathputli appears like a large toy doll, which wears a vividly coloured attire. The puppetry act is a type of theatre art that involves the usage of puppets or inanimate objects portrayed by animals or humans dangling to the voice and the melodies of the puppeteers, which is called puppet play or kathputli, dance. However, the puppet craft was practiced for the entertainment of people in the olden times. Many good things could undoubtedly be explained to the public through the demonstration of puppetry shows. Nowadays, puppetry shows are performed in several states of India, such as Rajasthan, Orissa, Karnataka, and Tamilnadu. Nevertheless, Rajasthan is distinguished as the Kathputli craft hub due to its unique characteristic features. The Kathputlis were constructed in medieval Rajasthani style from a single cantle of wood with a multicoloured attire, as shown in Figure 7. The distinctive characteristic of the Rajasthan puppet is that it has an egg-shaped face and extensive eyes with raised eyebrows and long lips [24].

Figure 7. Kathputlis used to entertain audiences [25]

Word 'Kathputli' is derived from terms Kath and Puttali, where 'Kath' means wood and 'Puttali' means puppet or doll. The Kathputli of Rajasthan are often two feet in height. In addition, its body is formed by a thick sponge. Craftspeople of Rajasthan have utilized the waste cloth for giving the draft shape of the puppet. The puppet's attire is constructed according to the subject by using different waste textiles. The attire is stuck on the puppet figure by using glue, a needle and thread. Following that, simple costumes have to shape the body, and then the movement of decoration arrives. According to Pandey, the Kathputli is constructed with a cantle of wood, and the extraneous shape of Kathputli is fabricated with the wastes of textile materials of different colour. Therefore, it can be concluded that this art contributed to recycling textile waste to produce new products used for entertainment purposes. Puppetry is presently founded in numerous contexts, such as in publicities, promotional activities, and various music videos.

Gabba

The Gabba handicraft belongs to Kashmir, which the poor people of Kashmir mostly produce for the winter season. Under this handicraft technique, Kashmiri people utilize the old material to manufacture a gamut of products. The craftspeople have shown their exclusiveness in embroidery or small-scale boutiques. It includes Gabba and Namda, which are extremely popular [26], although, in this craft, people can efficiently recycle worn-out woollen garments and blankets. The Gabba craft is similar to the Namda craft. Craftspeople in Kashmir were very proficient in these fields of the paper folding process, miniature sculptures, fine woodworking, weaving, and embroidery of Kashmiri Gabba, silver inscription, Gabba, Namda, shawls, jewellery making, carpet weaving, and Chaddar making. These products are appreciated for their comfort, adjustability, and biodegradability. The uniquely designed rugs of Kashmir are widely used, and popular in both urban and rural family units. A Gabba is a form of floor covering made of old woollen coverings known as 'Chaeder.' It is crafted from various structures and plants. Moreover, the three prominent styles of Gabba are applied, embroidered, or made in a mixture of appliqué, embroidery and printing, but the making of Gabba craft is an ancient art of Kashmir. Building these various kinds of carpets is a challenge for Kashmiri people, as they require the ability to scaffold and mould the rug out of its constituents [27,28].

Figure 8. Bird and flower motif used in Gabba [16]

While the conventional Gabba often portrays the blanket as a backdrop for the conformation, burlap Gabba is perfectly decorated with embroidery, like an antique instance of coarse fabric. Gabba is also designed with the motifs of traditional Namda handicraft. As well as ancient Kashmir, Gabba was complicated, with its finely knotted carpets with a central composition surrounded by the boundaries of Gabba. Gabba craft uses a wide range of motifs to produce final products.

Patchwork

The patchwork techniques to recycle fabric are practiced across the globe in many countries, but, specifically in India, patchwork craft is the most popular in the state of Rajasthan due to its characteristic features. In the early days of developing the art of puzzles, the patchwork was the utilization of stitching the remaining corners of the fabric, so that the practical aspiration of warm and cold can be accomplished. However, due to a shortage of material in ancient times, people recycled old textile so that they could construct cold quilts and garments. In patchwork craft, tolerance and precision are required at the time of planning and execution while constructing a patchwork item for determination, like cutting, stitching and overlapping on respective pieces of fabric into the variation fabric [28].

The patchwork method is a kind of needlework, in which different fabric pieces of different materials with different kinds of motifs or embroidery work are joined together to produce unique aesthetic features. The fabric is cut into numerous configurations, and attached to the adjacent fabric pieces by stitching. The whole fabric is thoroughly utilized in producing entirely new products by using fabric

patches assembled through needlework. For this reason, the patchwork can further be considered a well-known and effective technique toward recycling the fabric. It was also observed that the patchwork design and craft have been used to produce women's attire [29]. The importance of patchwork is not only exclusively utilitarian; patchwork has also had influence on embellishing [30]. Additionally, with the aid of the patchwork technique, any person can make raiment, quilts and fascinating decorations, such as bags, carpets, a wall hung, and even a bedsheet. The fashion industry in India has already recognised the significance of such methods to recycle textile waste and adopted practicing the patchwork method to increase the product life cycle.

Other techniques practiced to recycle old fabric and clothes

As discussed earlier, there are many techniques and methods practiced in many Indian states to convert old clothes, saris and other textile waste into useful products, which are of crucial importance, because these techniques are not just a source of revenue in rural areas but also a medium of depicting their visualization inspired by their culture. Apart from many discussed techniques, there exist different types of quilting work and appliqué work, like Tharu appliqué, Khatwa appliqué, and Peepli appliqué, which significantly contribute to the recycling of textile waste [31]. The homemakers produce quilts, and the old textiles and fabric waste is recycled in the process of making different layers. Appliqué is likewise a kind of method of textile recycling that utilizes versatile qualities of clothing. There are several methods of creating an appliqué. In the beginning, people draft a design herewith a marker and then cut it and sew it onto other clothes [32,33].

SWOT analysis and future scope

For the sustainable growth of the textile industry, reducing, reusing and recycling are effective and efficient ways of converting textile waste into useful products. Traditional Indian crafts perform a vital role in recycling worn garments, because the craftsperson utilizes used raiment to produce various valuable products. It was observed that despite many attractive government schemes, such as Skill India, Samarth, Mudra and many more, the reach of the benefits of these schemes is still limited to significantly less number of beneficiaries and needs to be improved. Apart from this, there is a strong need to train artisans and craftspeople involved in these techniques for improving the market potential of designed products. The ministry of textile government in India is establishing training centres for young artisans.

Young consumers prefer fast fashion because of the newness and freshness it offers. The same newness can be offered through these crafts by recycling the used textiles. With the rising demand of sustainability, major fashion brands have to change their business model and structure. Many companies have adopted green processes and started sustainability initiatives. Using traditional arts

and crafts for recycling and upcycling would bring more business and generate employment in the respective sector.

Every year, the requirement for fresh attire from the industry is growing, and with the worn-out apparel discarded and not recycled, it results in the rise of textile waste. Fashion products get obsolete not only because of the material but also because of the change of consumer behaviour and social factors. If, both on a small and large scale, the textile industry does not adopt recycling the scrap fabric, that will surely affect the future of the textile and fashion industry in India. In order to nurture and preserve these traditionally practiced craft techniques for the future, there exists a strong need of spreading awareness among the young textile artisans by highlighting the key benefits and organising workshops and training programs by the textile ministry of the government of India.

CONCLUSION

Sustainability has become an important issue in the business of fashion. Consumers have started paying attention to the sustainable aspects of the fashion products. Use of long lasting and durable materials for manufacturing is considered one of the prominent ways of achieving sustainability. However, in case of fashion products, it becomes an unfavourable option as people like to replace the clothing with season and occasion. The traditional textile techniques play a significant role in recycling textile waste into useful products with good market potential. Recycling has been an important matter as the wastage of clothing is growing with the rise in the population of the country. Hence, traditional textile techniques of different Indian states can be used to transform the used garments into new products through various recycling and upcycling techniques.

There are many ways of recycling and upcycling textile waste which are practiced in different states in India, like Kantha embroidery of West Bengal, Panja Dhurrie technique of state Haryana, Kasuti embroidery of Karnataka, Sujani of state Bihar, Chindi rugs and Chaklo, Gabba, Namda, patchwork, and Kathputlis of various Indian states.

It has been observed that the market potential of such uniquely designed traditional textile products through recycling is growing by the day. The artisans and craftspeople are adapting gradually towards selling recycled textile items through e-commerce websites for better reach to their targeted consumers in different Indian states. It was found that different schemes and skill initiatives of the textile ministry play a crucial role in improving the market potential of such uniquely crafted textile products due to the improvement in aesthetic features. Hence, the growth of all these traditional textile techniques used to recycle and upcycle fabric waste is crucial for achieving sustainable goals of Indian textile and fashion industry.

Author Contributions

Conceptualization – Singh S, Rani J; methodology – Singh S; formal analysis – Singh S, Rani J; investigation – Rani J; resources – Singh S, Rani J; writing-original draft preparation – Singh S, Rani J; writing-review and editing – Singh S, Rani J; visualization – Singh S; supervision – Singh S. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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