

**A QUALITATIVE STUDY ON THE IMPLICATIONS OF TEXTILE WASTE UPCYCLING AND ITS SUSTAINABILITY**

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**Abstract**

According to the statistics by the Municipal Solid Waste Management council, textiles constitute 6% of the total solid waste. The amount of solid waste generated in Mumbai alone goes upto 7500 metric tonnes per day. So 6% accounts for 450 metric tonnes of textile waste per day. In the context of this research paper, textile waste refers to leftovers from the garment manufacturing process such as, trimmings, ends of rolls, etc. Ideally for this leftover textile, the usual next step in the life cycle would be landfill or recycling. But this paper throws light on the role of startups in 'upcycling' textile waste. Jager (2012) states that upcycling is the process of converting waste materials into new materials or products of better quality. Production waste is the easiest material to use in upcycling because the volume produced is generally quite large and the supply is regular. The methods suggested in this study will drive a campaign towards reprocessing textile waste and developing innovative products from the waste which in turn will help in reducing the textile waste based pollution to some extent. A few startups were identified and interviewed in order to understand the functioning of this new system of textile waste reduction. This qualitative research may prove to be of significance to potential startups and pave way for further research on applying the concept of upcycling to other forms of solid waste. The study has been confined to the Mumbai region since majority startups which have pioneered this concept are based in Mumbai. The objective of this study is to gauge whether the recent concept of upcycling is a feasible and sustainable alternative to recycling and identify possibilities in the area of textile waste upcycling, to make the upcycled products survive against mainstream competitive brands.

Keywords: upcycling, textile waste, reprocessing, production waste, recycling, sustainability.

**Objectives of the Research**

1. To garner an estimate of the gravity of the textile waste situation in Mumbai.
2. To identify the measures that can be taken to manage the textile waste
3. To look for alternatives to disposal of textile waste in landfills.
4. To identify the availability of alternatives to recycling.
5. To gauge whether the recent concept of upcycling is a feasible and sustainable alternative to recycling

6. To identify possibilities in the area of textile waste upcycling, to make the upcycled products survive against other competitive brands.

### **Introduction**

The notion of upcycling was popularized in 2002 through the publication of William McDonough and Michael Braungart's seminal book, Cradle-to-Cradle, and was discussed therein by referring to rice husks and paper. These were upcycled in different ways: the paper was remade as a higher-grade product through technical processing, and could be seen as 'material upcycling'; whilst the rice husks were reused in a different context (from non combustible packing material to naturally fire retardant building material) and could therefore be seen as 'design-led upcycling'.

In an article by Dean (2012), which quoted Orsola de castro's views about upcycling as a design solution to environmental problems by explaining it as an artisanal approach to textile waste which requires creativity without any industrial intervention and also it being an innovative, design-led and inherently environmentally friendly solution to textile waste. One of the major factors differentiating upcycling from recycling is that recycling involves industrial processes to make the waste reusable, thus consuming further resources.

The textile waste in context to this study is the waste or leftover material generated during the cloth manufacturing process. The firms which practice textile waste upcycling in Mumbai are, a startup named 'Chindi' which is a pioneer when it comes to textile upcycling. Besides, fashion houses such as Mumbai-based brand, Ka-Sha by KarishmaShahani Khan, Kishco Ltd., and several designers and fashion houses, strongly focus on an ethical waste policy for creating a collection which has got reasonable attention in many international and domestic publications.

These firms have tied up with several cloth manufacturing units and regularly collect production leftovers from them. The color sorting is done to avoid re-dyeing, saving energy and pollutants. The textiles are shredded and blended with other selected fibers. The blended mixture is cleaned and then stitched along with other combinations of shredded fibers to create brand new clothing or any other innovative and useful objects such as rugs, tablecloth, mats, bags, etc. Recently, various fashion designers showcased creations made from upcycled fabrics in the 2016 Amazon Fashion Week.

### **Review of Literature**

1. RinkuAgrawal and Madhu Sharan in their review paper, Municipal Textile Waste and Its Management published in ISCA Journal have emphasized on recycling being the most viable option to manage textile waste. It has also been stated that even though recycling is a good option, it does require some amount of industrial processing to recycle textile waste.

2. DarshitaModi , in her research article , “upcycling fabric waste in design studio “ has mentioned the scope of upcycling in the fashion industry and has also suggested few feasible options of making best use of textile waste.

3. According to the thesis textile recycling: a system perspective, by Jana M. Hawley, Ph.D. Department of Textile and Apparel Management University of Missouri - by recycling, companies can realize larger profits because they avoid charges associated with dumping in landfills while at the same time recycling of textiles also contributes to goodwill associated with environmentalism, employment for marginally employable laborers, contributions to charities and disaster relief, and the movement of used clothing to areas of the world where clothing is needed.

4. Stromgardd Dalby Mette in her study, “Sustainable fashion: Issues to be addressed’ has emphasized on the importance of design in creating brand new product out of textile waste and making it not only useful but also worthy of competing with existing brands.

### **Research Methodology**

In order to conduct research, following methodology will be adopted.

- a) Universe of study: Firms in Mumbai involved in upcycling of textile waste
- b) Sampling Technique:- Snowball sampling method has been used since there are very few firms practicing this method of textile waste management on a commercial basis.
- c) Period of the study: The research will be based on the current data collected from respondents.
- d) Techniques of data collection: Study will be based on both primary and secondary sources.
  - i) Primary Data – Techniques for primary data collection for the proposed study are as follows:
    - Personal Interviews
    - Telephonic Interview
    - Emails
  - ii) Secondary Data: Secondary data for the proposed study will be collected from the following sources

- Websites
- Journals, Magazines and Periodicals

e) Research Approach: Qualitative Approach has been used and the observations have been recorded through field research method.

f) Research Design: It is a conclusive research and is descriptive in nature.

### **Practical Implications of the study**

1. The findings from this research can serve as a stepping stone for further research.
2. Disposal, followed by Recycling, have been the norms when it comes to textile waste management but both the options have adverse implications. While dumping leads to blocking of landfills, recycling also requires some industrial processing, thus consuming energy. So upcycling seems to be an option that requires least industrial intervention.
3. The next step in upcycling is to not just create innovative products and marketing them as eco-friendly products but also make them reasonable, utility based and worthy of surviving competition.

### **Limitations of the present study**

The inferences drawn would be purely based on the responses received from respondents and thus possibility of biased opinion cannot be ruled out.

There is geographical limitation for this study as it is confined to firms within Mumbai region. Since very few firms upcycle textile waste on regular and commercial basis, the availability of data is sparse. This concept has gained attention recently and hence there is no reference point or past data to base the study on. However, every possible effort is taken to make the study useful for further research.

### **Findings**

Kishco Silver Pvt. Ltd is a firm based in Fort, South Mumbai. Kishco Group, Mumbai. Used clothing comprising of wool, acrylic and cotton sweater are converted into re-generated fibre by Kishco Group. According to NoharNath of Kishco group, the business of sorting and grading of textile consumer waste imported from the developed countries happens in the Kandla Special Economic Zone in Gujarat, 600 kilometres to the north of Kishco's Mumbai base. It is one of the largest centres of India where sorting and grading of textile wastes takes place. Some of the used clothing waste imported into India is also used for wiping material. The supplies mainly come in from U.S.A. and Europe. Post-consumer textiles wastes are also up-cycled in small Indian clusters. Traditionally, fabric from old cotton sarees are made into layers and stitched together using run stitches, to give a unique design effect. This product termed as "Kantha" is used for infants and children as blankets and wraps as it is soft and suitable for the Indian climatic conditions. Kantha work is famous in the eastern states of India like Bihar, West Bengal, Assam and Orissa. The

nomadic Bakkarwal and Gujjar tribes of Jammu and Kashmir use acrylic yarn for embroidery on the old woolen felt blankets and convert it in to a beautiful needle worked handmade rugs. This is a part of their tradition and culture and a method to preserve the old textiles. They also use old textiles to make caps, bags and other accessories with beautiful hand embroidery. Similarly, the nomadic tribes in Rajasthan, India do patch work, embroidery and mirror work to give a bright new look to their dresses. A number of accessories are also created on recycled textiles with surface embellishment by this community and marketed by different NGOs and traders for the domestic & international market. In an interview with Mrs. MinooNath – Managing Director of Kishco, it was learnt that Kishco, which began its operations with polyester manufacturing, retain their textile waste and upcycle it to manufacture mattresses and blankets. The company had considered recycling its textile waste. According to her, the firm is able to cut down on its textile waste up to 40 %. This not only reduces the need to transport the waste to dumping grounds but also lessens the amount spent on raw materials for manufacturing mattresses by 25%. They have a team of professionals for conducting research on using the textile waste optimally and ensure the products durability. The team also ensures that products made using textile waste are at par with the products manufactured from scratch.

‘Chindi’, an all women run organization that has pioneered upcycling of textile waste, has been active since 2015. It is based near a slum in Mankhurd and its staff comprises of designers and skilled workers who are all women who also live in Mankhurd. Chindi was founded by Tanushri Shukla. She tied up with the T-shirt and a few garment manufacturers around Mankhurd for collection of their textile waste. Availability of textile manufacturers in close vicinity made it easier to acquire raw materials easily and with minimal transportation costs. This firm helped the nearby cloth manufacturing units in disposing off their waste without congesting the dumping grounds. Infact, most of the manufacturers would initially throw away their waste wherever it was convenient thus causing accumulation of garbage in public places, creating health hazards for animals consuming that waste and leading to environmental hazards. Besides, it proved to be cost effective for ‘Chindi’ because it did not have to spend money on acquiring raw materials. Indirectly, it saved the Municipal Corporation expenditure on recycling the waste and also more employment options were generated for the women around the centre.

In an interview with designer KarishmaShahani, “[Ka][Sha] my first upcycled cloth brand was started four years ago. I was introduced to upcycling as a fashion student in London, and knew that I wanted to make the practice my mainstay. I had done an entire collection from old banarasi borders, used vegetable sacks to create jackets and made flowers from waste fabrics to use as applique on my designs. Last season, I showcased a denim jacket that was made out of five pairs of jeans. I have a zero-waste policy, so everything that is left out finds its way into my next collection.” This conversation affirms that fact that upcycled products are not just considered as an ‘eco-friendly’ option but can be marketed as premium or mainstream commercial products. She also stated that recycled products are usually bought by consumers as a ‘pity purchase’ i.e people

buy recycled products not because they need those or like those products but as an act of charity, to help an NGO or “do their bit for the society”. These products will not find their place in mainstream market and hence the market for recycled products is limited and also uncertain.

Upcycling seemed to be a more viable option for many more firms including the ones mentioned above for the following reasons:

- There is a lack of proper structure formed by Municipal Corporation and concerned authorities, as a result there is a confusion about the right way to dispose the industrial textile waste.
- Even the firms which take extra effort to send the textile waste to the BMC collection centres, are not aware of the way this waste is treated later.
- The textile waste that is collected by Municipal Corporations is then segregated and sometimes due to improper classification of textile into reusable and unusable, even the recyclable textile is packed off to the dumping grounds situated around the city i.e. Deonar, Mulund&Gorai.
- This textile waste clogs the dumping fills. That space could have been used for other solid waste which had no scope of being reused or recycled.
- Now looking at the textile waste which was classified as reusable. The recyclable waste is then shredded using a shredding machine, then it is cleaned and the shreds are converted into low quality yarn which is used for insulation or filling purposes such as fillers for car seats, etc. This process requires energy.
- Another method is loading the waste into incinerator machines and burn it to create heat energy which is converted to thermal energy for any industrial processes.
- Although, recycling helps reduce industrial textile waste to some extent, it requires industrial intervention, it also needs to reach the appropriate BMC centers and is dependent on the Municipal Corporation processing. As opposed to this, Upcycling needs no industrial intervention, is not dependent on the procedures followed by the Civic and Municipal authorities and gives the ability to each textile firm to contribute in lowering the pollution levels.

In an article Murray (2002) states that design for upcycling is about ‘not merely conserving the resources that went into the production of particular materials, but adding to the value embodied in them by the application of knowledge in the course of their recirculation.’ So, if one can add value – economic, intellectual, emotional, material – to a product through the process of reuse, it can be called ‘upcycled’.

From the environment perspective, Upcycling may seem to be an easy to implement option. But what needs to be explored is the sustainability of this option in long term.

According to fashion designer and NIFT alumni Darshita Modi, in her research, Upcycling Fabric Waste in Design Studio, Upcycling is most efficient if used within the production company itself and under the same brand, sending all generated waste back to the production process. This entails implementing up cycling in the design process of the main product – pre-calculating the textile waste generated and designing the patterns for side products so that they can be easily made of the textile leftovers. So if a mechanism is devised so as churn out design and ideas based

on the kind of textile waste, optimum utilization can be achieved.

As mentioned by Tanushri Shukla from 'Chindi', firms which upcycle textile waste are doing reverse production i.e. instead of the ideal practice of deciding the raw material based on what a firm wants to manufacture; in this case, the firm decides what can be created using the raw material available. This concept seems volatile and unpredictable but that can be used as a strength to design customized and one-of-its-kind designs. This idea has been the USP (Unique Selling Proposition) for upcycling.

The recently concluded, Amazon India Fashion Week, displayed creations by noteworthy fashion designers such as Archana Kochchhar, Amit Aggarwal made out of up cycled textile waste. Infact, Lakmé India Fashion Week Summer/Resort 2017 held in February this year dedicated its second day to Sustainable Fashion and Indian textiles, displaying several brands who are creating a new vocabulary for sustainable fashion narratives in the country; the show aptly titled Reincarnations focused on the various ways fashion can acquire a new life through repurposing, reusing, and upcycling.

Mumbai based designer MeghaRawat, launched her brand Kurio, which up cycles textile waste to make trendy customized footwear. The brand is going strong since the past two years and Megha asserts that not a single material used by her so far is first hand. It is an inherent advantage that the footwear design is based on the availability of textile leftover and hence each creation is unique by default. A lot of designers are also gathering textile waste from remote locations from all over India, especially the traditional fabrics, in order to retain the heritage to whatever extent possible. It has also been pointed out that fabrics once recycled lose its quality to some extent. The ancient natural fabrics in India were of superior quality than the once synthetically manufactured in recent times. So up cycling natural fabrics leads to making a better use of those than recycling or even worse dumping those textile leftovers.

Mumbai-based Italian social changemaker, Stefano Funari approached Paola Bertola of Fashion in Process, a research lab at Design Department of Politecnico di Milano University and pitched a possible collaboration involving the sari and upcycling. Paola and her team of designers eventually came up with sari products using simple tailoring techniques that not only reinvented the garment but also imbued it with global resonance. In April 2013, three designers from Fashion in Process came down to Mumbai to conduct a week long training program for 20 underprivileged women; the initiative now hires 50 artisans and sold 20,000 handcrafted items last year. In his words, "I wanted to primarily focus on re-using the object itself rather than melting it down."

Funari states that 90% of his creations are sold abroad and has a rising demand in Europe. He points that textile waste need not be upcycled only into clothing but can also be transformed into accessories, bags, decorative household items and gifts. Products made from organic Indian fabrics have a wide market abroad and many firms exporting products made from traditional Indian fabrics have provided employment options to Indian craftsmen and artisans. He highlighted, "Sustainable fashion is trendy now internationally, it is a topic with big appeal. Established brands

like H&M, for example, they all try to subscribe to it.” So there is a scope for growth in the up cycled textile waste area. Funari concluded, “There is interest but there is a long way to go before sustainable fashion is a widely accepted and practiced concept.”

### **Conclusion**

Recycling helps reduce industrial textile waste to some extent, it requires industrial intervention, it also needs to reach the appropriate BMC centers and is dependent on the Municipal Corporation processing. As opposed to this, Upcycling needs no industrial intervention, is not dependent on the procedures followed by the Civic and Municipal authorities and gives the ability to each textile firm to contribute in lowering the pollution levels.

Upcycling is most effective for a firm where the textile waste is generated through its own industrial processes. The raw material for up cycled products is the waste material of other firm textile manufacturing firms and hence it is readily available and at minimal or no costs. It is also a helpful for the manufacturing firms since it helps them deal with the issue of their textile waste disposal.

Unlike recycled products, upcycled products are created to be more value added and mainstream products so as to help them compete with other regular and at times premium products. Infact, many superior quality Indian organic fabrics find a new life due to this trend. Upcycled products are gaining popularity in India and more so abroad. Thus, strengthening the sustainability of the up cycled product market.

### **Recommendations:**

1. Government can create more awareness about the possibilities of this concept among citizens and textile firms.
2. Knowledge of Up cycling can be a source of addition income to those who possess creative skills and indirectly bring down the amount of textile waste gradually and without depending on Municipal authorities.
3. Firms involved in regular textile manufacturing can utilize the waste to up cycle innovative products or look out for such centers and donate or sell their waste at minimal costs.
4. Artisans and craftsmen can make use of this concept to transform the local fabrics into globally demanded designs.
5. This concept can be embedded in the curriculum for fashion and textile design students so as bring the awareness and technical know-how about sustainable fashion.
6. Municipal Authorities can segregate textile waste and only those materials which are completely unfit for reuse or up cycling can be sent for recycling. This is to reduce the burden on recycling mechanism and eventually reduce the congestion of dumping grounds.



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