

1. Introduction:

The Problem of Textile Waste

The textile industry is one of the largest industries in India and over earth. Textile industry generates vast and significant amount of waste in its production cycles. Textile waste is a major environmental problem, as it takes up space in landfills, contributes to greenhouse gas emissions, and pollutes the environment. Every year, millions of tonnes of clothes are manufactured, worn and discarded. No wonder, globally, the textile industry is known as a polluter because of its greenhouse gas (GHG) emissions, discharge of waste water, dumping of used clothes, use of chemicals which are often carcinogenic, etc. As the textile industry consumes huge quantities of resources such as water, energy and chemicals during its production, the indiscriminate use of these resources poses a threat to sustainability of life on the earth.

However, there are solutions to minimize these problems, and use of sustainable fibres, process, chemicals coupled with textile recycling and circularity are some of them. By using textile scraps or Chindi's, trained man power can create altogether new products that are not only sustainable and attractive but also remunerative. Such recycled products are catching the mind of new generation and offer more market. The textile products used for recycling include chindi, rugs, used clothing, accessories, and many more. Sustainable textile recycling has several benefits. First, it reduces the amount of textile waste that ends up in landfills. Second, it conserves natural resources, as it reduces the demand for virgin materials such as cotton, silk, viscose, etc. Third, it creates additional job opportunities for artisans and workers who are skilled in textile recycling.

Sustainability: "Meeting the needs of the present without compromising the ability of future generations to meet their own needs."
- United Nations Brundtland Commission.

Sustainability leads to meeting the need of the current generation without compromising the needs of the future generation while maintaining a balance in sense of economic growth, environmental care and social well-being.

Overall, the goal of this document is to provide information indepth input on sustainable textile recycling, with a focus on the use of textile scraps or Chindi's to create new products. By doing so, it is hopeful of inspiring individuals and businesses to adopt sustainable practices in the textile industry and contribute to a more sustainable future.

1.1 Types of Textile Waste

There are several types of textile waste, including:

- i. **Pre-consumer waste:** This type of waste refers to the scraps and leftovers of fabrics, accessories and materials generated during the manufacturing process.
- ii. **Post-consumer waste:** This type of waste includes used clothing, bedding, towels, and other textiles that are discarded by consumers.
- iii. **Deadstock:** This refers to unsold inventory or surplus fabric that manufacturers, brands or retailers have not been able to sell.
- iv. **Off-cuts and trimmings:** These are small pieces of fabric that are cut off during the manufacturing process.
- v. **Damaged or defective products:** These are items that have manufacturing defects or have been damaged during transportation or handling.
- vi. **End-of-life textiles:** These are textiles that have reached the end of their useful life and can no longer be used, such as worn-out clothing or linens.
- vii. **Mixed waste:** This type of waste includes a combination of different types of textiles, making it difficult to recycle or repurpose.

1.2 Circular Economy

The concept of a circular economy is an alternative to the traditional linear economy of take-make-dispose. In a circular economy, resources are kept in use for as long as possible, waste and pollution are minimized, and materials are regenerated at the end of their life cycle. The goal of a circular economy is to create a sustainable and regenerative system that benefits the economy, society, and the environment.

By promoting sustainable and regenerative practices, the circular economy can help to create a more sustainable and equitable world for all. In the textile industry, the circular economy is particularly relevant, as it can help to address the environmental and social impacts associated with the production and disposal of textiles. Through practices such as recycling, reuse, and closed-loop production, the textile industry can move towards a more sustainable and regenerative system that benefits both the industry and the planet.

If It Can't Be Reduced,
Reused, Repaired,
Rebuilt, Refurbish,
Refinished, Resold,
Recycled Or Composed
Then It Should Be
Restricted, Redesigned,
Removed From
Production.

Waste Isn't Waste until We
Waste It.



1.3 Principles of reduce, reuse, and recycle and how they apply to textiles

The principles of reduce, reuse, and recycle are important concepts in the sustainable management of resources, including in the textile industry. Here's an overview of how these principles apply to textiles:

i. Reduce: The principle of reducing refers to reducing the number and quantity of resources used in production and consumption. In the textile industry, reducing the use of virgin materials, such as cotton or polyester, can be achieved by using recycled materials, reducing the use of chemicals, and optimizing production processes to reduce waste.

ii. Reuse: The principle of reuse refers to using products and materials for their intended purpose again after refurbishing, if required, rather than directly discarding them. In the textile industry, this can be achieved through initiatives such as clothing swaps, vintage and second hand shops, and rental services, which keep clothes in circulation for longer periods.

iii. Recycle: The principle of recycling refers to the process of breaking down materials to create new products. In the textile industry, this can be achieved through recycling fibres, such as polyester, nylon, or cotton, to create new textiles or using recycled textiles to create new clothing. Recycling reduces the amount of waste sent to landfills, conserves resources, and reduces the environmental impact of textile production.

Implementing these principles in the textile industry can help to reduce the industry's environmental impact by conserving resources, reducing waste, and extending the life cycle of textiles.

The principles of a circular economy include:

Designing out waste and pollution: Products are designed to be durable, repairable, and recyclable, with minimal waste and pollution throughout their life cycle.

Keeping products and materials in use: Products and materials are kept in use for as long as possible through practices such as reuse, repair, and recycling.

Regenerating natural systems: Natural systems are regenerated through practices such as regenerative agriculture, reforestation, and restoration of wetlands and other ecosystems.

Closing the loop: Materials are kept within the economy and used to create new products, rather than being discarded as waste.

Sustainable Fashion Is Not A Trend But The future

2. The Benefits of Sustainable Textile Recycling and Upcycling

There are several benefits of using sustainable textile recycling practices to create new products from chindis or textile scraps. Following are some of the key benefits:



i. Environmental benefits: By using textile scraps or Chindi's to create new products can help to reduce the amount of textile waste otherwise that ends up in landfills and take hell lot time for degradation and decomposition. Textile waste is a significant contributor to the world's waste problem, with an estimated 92 million tons of textiles waste generated each year. By reducing textiles waste, we can conserve natural resources and reduce the environmental impact of textile production, including the use of water, energy, chemicals and other inputs.



ii. Social benefits: Sustainable textile recycling can create huge job opportunities for artisans and workers who are skilled in handicrafts creation. This can contribute to social and economic development, particularly in countries where this practice is common. By providing employment opportunities, sustainable textile recycling can help to lift people out of poverty and improve their standard of living.



iii. Economic benefits: Sustainable textile recycling can be a cost-effective way to create new products, particularly when compared to the production of new textiles from virgin materials. Additionally, by creating products that are made from recycled materials, companies can differentiate themselves in the marketplace and can appeal to environmentally conscious consumers. This can help to increase sales and profitability, while also contributing to a more sustainable business model. This method also boosts economics of worker by creating additional job roles.



iv. Creative benefits: Chindi's or textile scraps come in a range of colors and patterns, which can be used to create unique and creative products. This can appeal to consumers who are looking for products that are not mass-produced and have a personal touch. By creating products that are visually appealing and unique, sustainable textile recycling can help to differentiate companies from their competitors and attract a loyal customer base.



v. Cultural benefits: Traditional Indian textile product such as Razai made from used cloth are great examples in sustainable textile recycling practices. This method of creating Razai and other traditional materials can help to preserve cultural traditions and techniques. By incorporating traditional textile products into new and innovative designs, sustainable textile recycling can help to celebrate cultural heritage and promote diversity.

The benefits of sustainable textile recycling using Chindi's or textile scraps are numerous and wide-ranging. By adopting these practices, we can create new products that are both sustainable and attractive, while also reducing the environmental impact of the textile industry and creating social and economic benefits.

Saree, Dhoti, Lungi are single piece of rectangular unstitched fabric. One of the most important aspects of sustainability is affordability and longevity of the commodity, which would encourage people to use the product. These are zero waste product and trendy with traditional aspects.

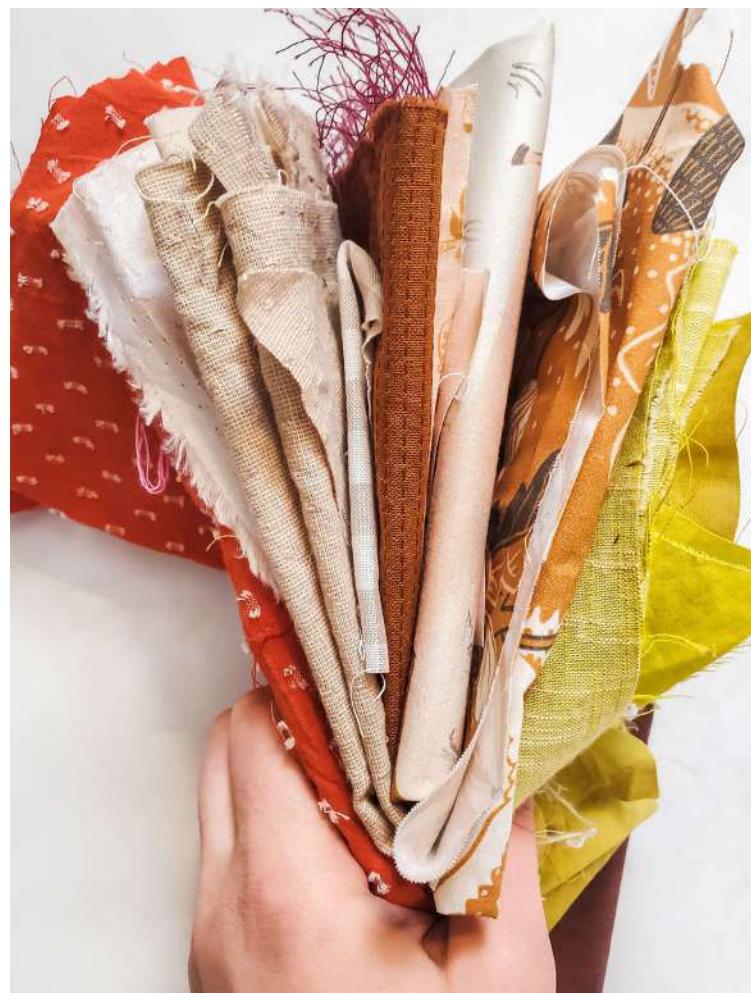


2.1 Creation of New Product from Chindi – A great leap in textiles Circularity

In this course material pre consumer waste mainly the textile scrap or Chindi is only considered for giving value addition and recreating market for the same. Textile scraps or Chindi refer to small pieces of fabric that are leftover from the production of apparels, such as clothing, linens, or other apparel products. These Chindi's are generated at various stages of the production process, mainly at cutting, sewing, and finishing, etc stage of garment process.

Chindi's, are small strips of fabric that are left over from the production of textiles. Chindi's are mostly produced at fabric cutting stage. In garment industries, the cloths in multi layer are spread for cutting using patterns to produce desired clothing. The typically cutoff materials are called Chindi's. As the garments are often come in cotton, polyester & its blend, silk, etc and comprise of range of colors. The Chindi's are also of same fibre composition as of main component. The Chindi's often come with different size and patterns. The Chindi's can have a significant impact on the environment if they are not properly managed. The impact of textile scraps and Chindi's on the environment depends on how they are managed and disposed. By adopting sustainable textile recycling practices, one can reduce the negative impact of these Chindi's on the environment. When textile waste is generally sent to landfills. most of the man-made chindi do not get decompose or take exponentially long time to decompose. Even some textile Chindi's like cotton, viscose, wool, silk, etc, get decompose, they releases greenhouse gases. And also the chemicals used in them can percolate into drinking water system. Therefore Chindi's can contribute to air, water and soil pollution. To overcome the environmental and social scrutiny, the textile industry needs to either minimize waste or reuse such inevitable wastes in any productive way. Otherwise these scraps pollute environment including water and pose longstanding adverse impact on human life.

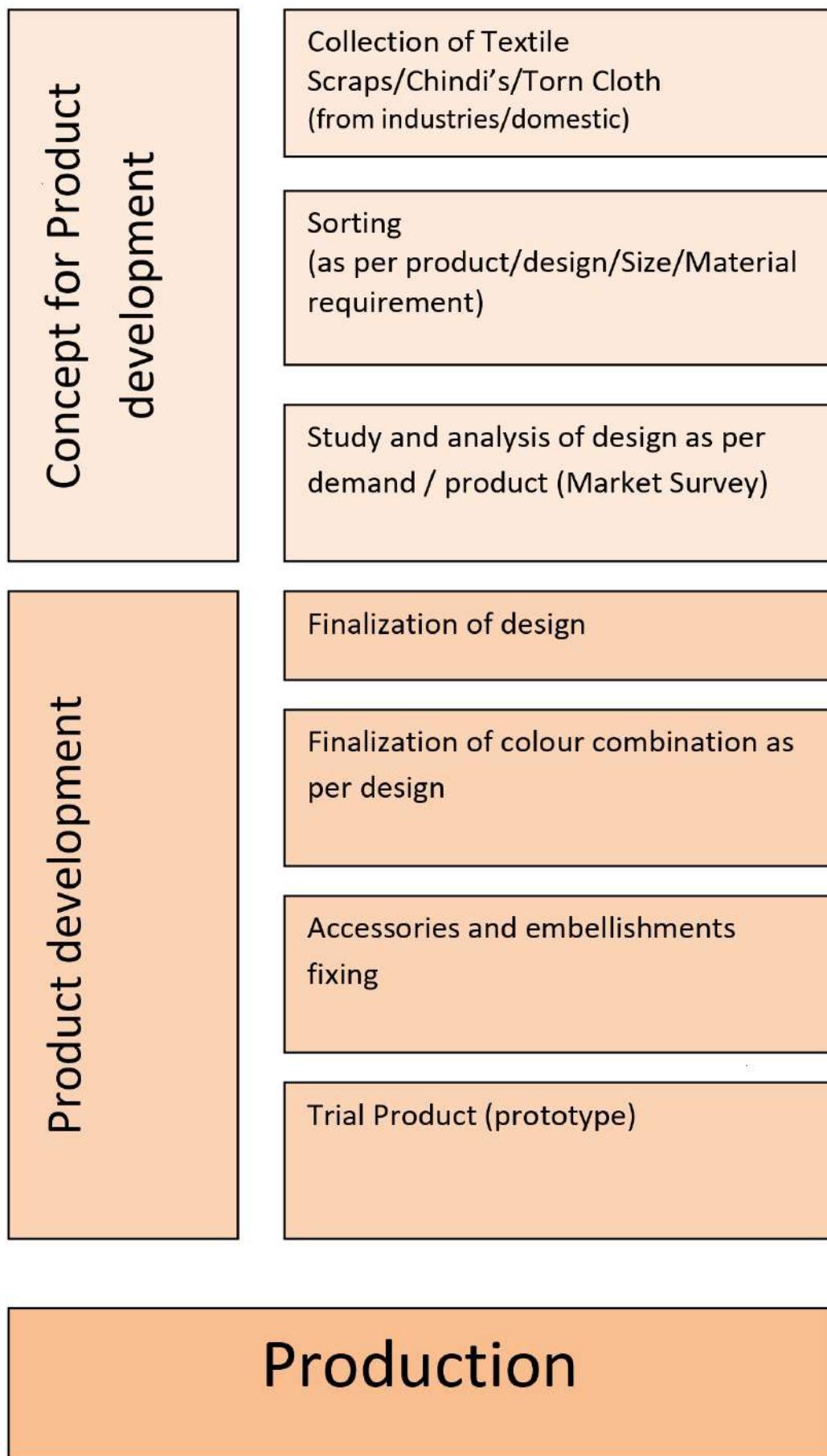
**From Waste to Wow:
Give Textiles a Second
Life for a Sustainable
Future.**





3. The Production Process of Sustainable Product from Textiles Waste

3.1 Flow path:





1. Textiles Scraps/Chindis



2. Sorting



4. Trial for combination



3. Combination as per design



5. Placing Samples



6. Stitching scraps as per final combination



Products from Scraps

Stitching as per design requirement and then sent for final product designing.
eg. jacket, casual pants, handbags, wallet, rugs, skirts, etc.

3.2 Basic Concept of Product Crafting

Deciding product line to be produced and creativity of transformation of scrap to value product is the initial stage for any designer. For this, Designer need's to do market survey, desk work analysis regarding various requirements to produce the various creative products which meets the circularity and sustainability.

i. Raw Material: Availability of scraps is the core factor for any production. Based on the availability of textile scraps, size, quality, material etc. designer/craftsman apply their creative minds to transform such textile scraps into value product(s) which meets the market requirement of demand and supply. Different types of textile scraps of woven/knitted/non-woven according to color combination having various types of fiber (such as cotton, polyester, silk etc.) may require different design techniques. Therefore, it is important to identify the type of textile scraps to be used before finalizing the product including design concept. The quantity and quality of the textile scraps will determine the feasibility of the design concept.

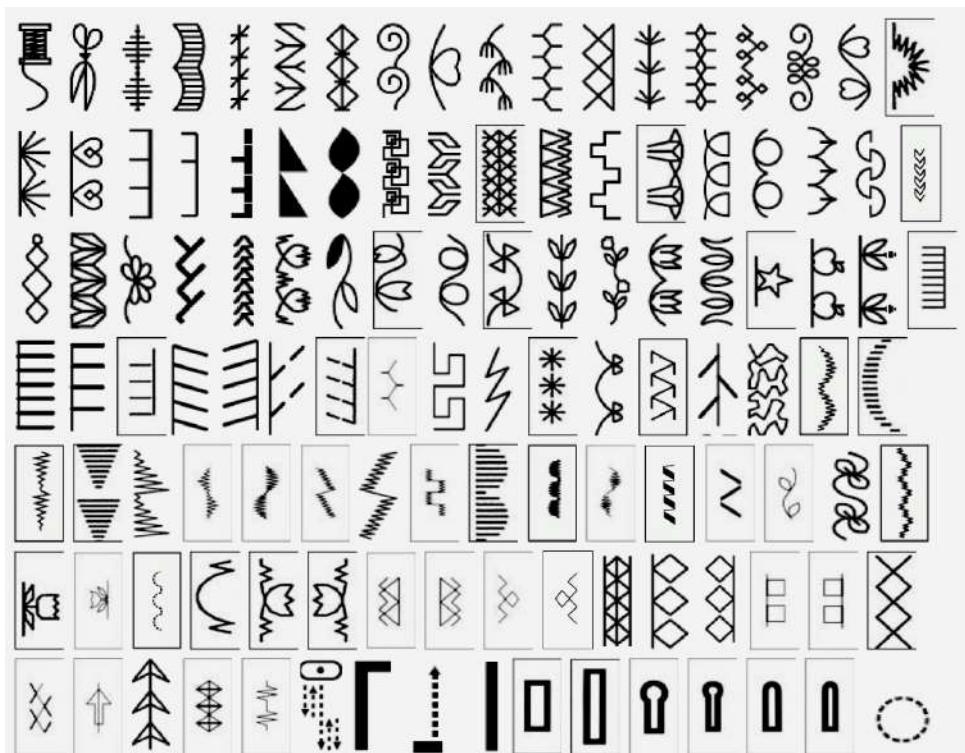
ii. Product idea: The designer using creativity, skill ideas by considering the concept of marketing, demand & supply decide the product line to be produced from such type of scraps. It is basically the idea of what products may be developed according to availability of scraps. On that basis, he/she decide the various factors to be required to make the end product such as what size, color combination, raw material, machine, design, process, value addition component, customer requirements, marketing and selling etc may be implemented.

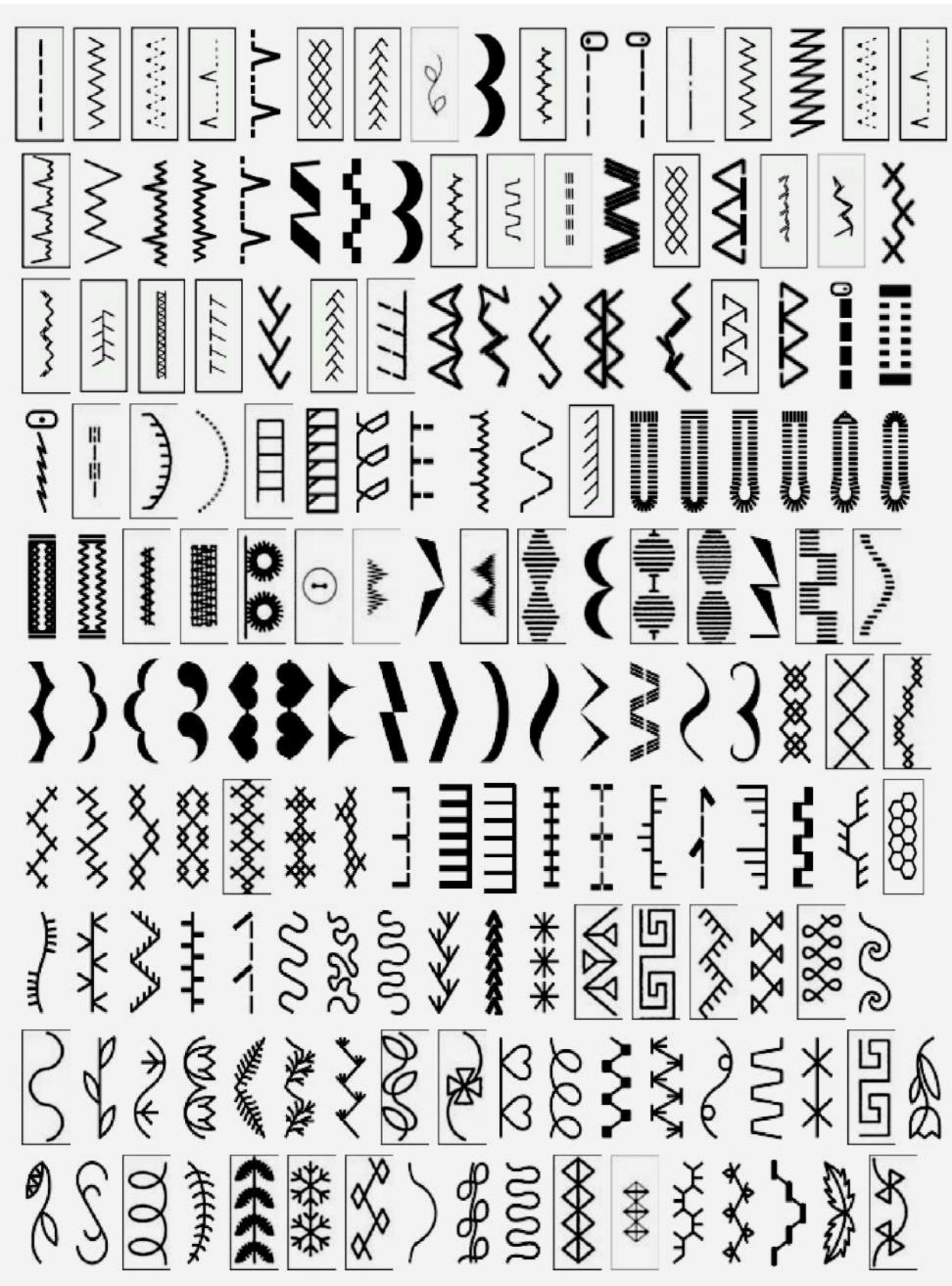
iii. Process Methods: Depending on the textile scraps, end product, different process or crafting techniques may be used to create the final product. For preparation of any end product various types of techniques may be implemented such as designing, stitching, fusing, knotting, bonding etc. Different techniques of stitching pattern may be used according to aesthetic visual, product design, decoration and specification.

iv. Machine: Depending on the end product designing, various machines including stitching providing decorative and functional stitches, embroidery machines, bonding machine for heat set, pressing etc. may be uses (as the case may be).

Examples: The scraps may be utilized for any product development such as making purse, tote bags, ladies bag, laptop bag, ladies crop top, dress, designer shirts, casual pants, over coat, designer coat, accessories, door mat, curtains, bed sheets, rugs, tissue paper/napkin box, etc. For making a short fabric from scraps by combining together, various types of stitches available on automatic sewing machine providing decorative and functional stitches may be used to enhance visual effects or decorative pattern such as:

Less waste,
more style





v. Skill Set (Manpower): Crafting involves various activities that require different skills and manpower. The specific manpower requirement for crafting depends on the type of end product/craft and the scale of production. Some common roles involved in crafting on the basis of scale of production includes designer(s), craftsman, production workers, some self help group, packaging staff, marketing and sales personnel etc.

vi. Marketing & branding: Marketing and branding play a critical role in introducing and promoting a newly developed product to the market. Marketing and branding efforts should be tailored to your specific product, target audience, customer feedbacks and conditions of market.

3.3 Crafting the circularity from chindis

i. Collection of Chindi: The first step in the production process is the collection of textile scraps or chindi's from reliable sources. These materials may come from various sources such as textile manufacturers, garment factories, households or Scrap collection centers. Collection of textiles chindi's from industries involves several challenges. If chindi's are from the same lot then there will be less effort to sorting in respect of pattern, size, color, etc. Therefore collection of the waste from industries with same lot is more beneficial and care must be taken to see that such scraps are free from hazardous chemicals including Azo dyes, formaldehyde, heavy metals, etc.

ii. Sorting: The collected materials are sorted primarily according to their type, color, weight and quality to ensure that sorted scrap materials are used for making new textile product to promote the sustainability. If it is from same lot then it will be easy to sort and use to prepare sustainable fabric. Industrial Chindi's are mostly remnants pieces of textile that are commonly generated during the cutting and stitching process while making garments or other textile products.

a) Sorting according to color: Chindi's can be sorted according to their color. This is particularly important for new products that require a uniform color, such as short fabric, bedding, tablecloths etc.

b) Sorting according to fiber content: Different types of fibers have different properties, which can affect the quality and potential uses of the material as final products. Sorting by fiber content can ensure that the material is suitable for specific products, such as clothing or upholstery. This may be mostly done by experienced hands and with the help of technology.

c) Sorting according to size and shape: Chindi's can be sorted according to their size and shape to ensure that the resulting material is consistent and suitable for the intended use. For example, larger Chindi's may be more suitable for products that require larger pieces of fabric, such as bags, curtains, bed-sheets, dress material etc.

d) Sorting according to quality: Sorting Chindi's according to quality can help to identify material that is suitable for high-end products or for products that require a specific level of quality, such as luxury accessories, dress material, great visual, bedding or high-end clothing.

Overall, sorting mechanisms for textile waste Chindi's are important for ensuring that the resulting material is of a good quality and suitable for its intended use.

iii. Cleaning: Once the Chindi's or textile scraps are collected, they are cleaned to remove, dirt, foreign materials, etc. The cleaning may involve washing, drying, and ironing the materials to remove any foreign matters, dirt or debris. This process is essential to ensure that the materials are clean and ready for the next stage of production.

iv. Designing: Once the end product is finalized and processing method has been chosen, the final product design & specifications can be determined. Designing includes followings points:

- Prepare a rough design and patterns on the paper.
- Accumulate all panels/patches of fabric and put on the table to oversee the product.
- Hit and trial of pattern, colour and material combination change to oversee the effect on final product.
- Consider the weight, texture, and color of the patches/fabric.
- Application of the embellishment and other decorative items.
- See the overall designing and patterns to be developed.
- Develop sample.
- Testing and refinement (Optional): The final product concept should be tested and refined to ensure that it meets the required quality standards. This may involve testing for durability, comfort, and other performance factors.
- Production: Once the prototype approved, it can be produced according to scale of production.

The process of finalizing a product or design concept for preparing sustainable fabric from textile scraps involves careful consideration of the type and quality of the textile scraps, the processing method, and the final product specifications. With proper planning sustainable fabric products can be produced from textile scraps in an effective and environmental friendly manner.

v. Cutting and Sewing: After the finalization of the design, scraps according to combination are cut into the desired shapes and sizes according to. This may involve using a template or pattern to ensure consistency. The pieces are then stitched together to create fabric panels and then into a final product. This stage requires specialized skills and techniques to ensure that the materials are crafted or transformed into a finished product. Bonding techniques may be used in some cases. The value addition component may be added such as embellishments, embroidery or tassels etc.

vi. Finishing: Once the product is complete, it may undergo a finishing process to enhance its appearance. This may involve trimming, washing, ironing etc. The finishing process helps to ensure that the final product is attractive and long-lasting.

vii. Quality Control: Before the final product is packed or sold, it should undergo a quality control process to ensure that it meets the required specification/standards as demanded by buyer. Quality control may include testing for banned chemicals like Azo dyes, formaldehyde, color fastness, tracer of heavy metals like chromium, nickel, lead, arsenic etc. The inspection may be done in respect of presence of foreign matters like metal pieces, broken needle etc. By using scrap materials, the production process reduces waste and helps to protect the environment, making it a sustainable and responsible approach to new sustainable textile production.



3.4 Parameters for Review at

Sampling stage:

- Follow the design concept
- Checking different issues/faults
- Measurements checking
- Checking Fabric Scraps/Yarn color, GSM, etc properties
- Checking of SPI and other parameter

Marker making stage:

- Checking of Fabric width as per requirement
- Checking of Fabric length as per requirement
- Matching of grain line
- Checking of pattern size and dimension
- Matching of correct checks patterns (check and stripe)
- Pattern direction

Fabric Spreading & cutting stage:

- Fabric spreading according to correct alignment and design
- Maintain requirements of spreading
- Matching of checks and stripes with designs
- Correct layering and direction of fabrics as per requirement and design
- The dimension of the pattern and the cut pieces should be same, accurate and as per final design.
- Quality checks for edges
- Maintain cutting angle

Sewing Section:

- Checking of Input material
- Checking of machine condition
- Checking of thread count
- Special work like embroidery, attachments of beads, tassels, small mirrors or any other accessories
- Selection of needle size as per type of fabric parameters
- Checking Stitching faults
- Attention on product measurement
- Checking of seam faults
- Ensuring correct placement of interlining (if required)
- Control and ensure about removal of creased or wrinkle in the fabric

Quality Control in Finishing Section:

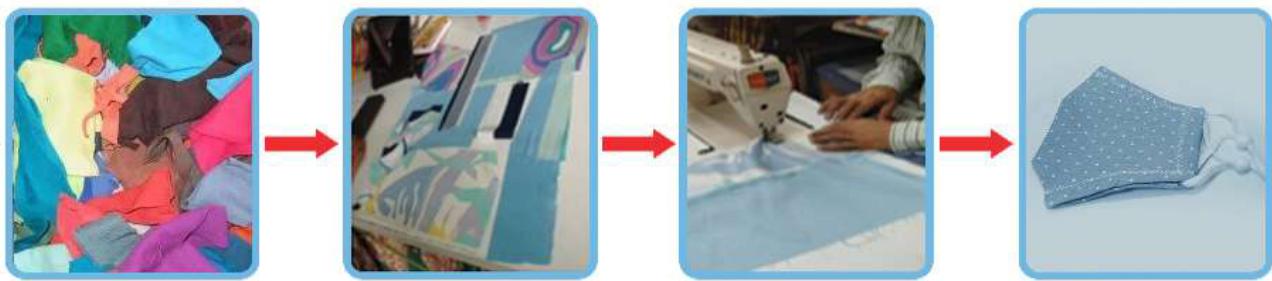
- Inspection of the final sustainable product
- Inspection about attached accessories
- Inspections about every parts of new product
- Inspection about packaging of the final product



4. Transformation of scraps to Sustainable Textiles articles

I. Face Mask

During the COVID-19 pandemic, everyone is concerning about health protection and looking for safety. In that scenario face mask was the key factor to protect from virus. In starting, the production of the commercial face mask (Surgical/N95 etc.) was increased but limited. Therefore, to mitigate the need of face mask, the production of the fabric face mask is increased both at household & some industrial units. Masks are crucial for healthcare workers and can also prevent the spread of the virus. As a result, governments emphasized the production of masks to meet the demand. This created employment opportunities and provided financial support to many families during the financial crisis caused by the pandemic. The increased production of masks not only served as a vital tool in safeguarding the health of healthcare workers but also created a significant positive impact on the economy. By doing this, it boost the concept of sustainability. These jobs provided much-needed financial support to individuals and families who were facing financial hardships during the pandemic-induced economic crisis. The manufacturing of face masks not only bridged the supply gap but also acted as a lifeline for many households, ensuring that people had a means to support themselves and their families during these challenging times.



II. Patches to Sustainable fabric

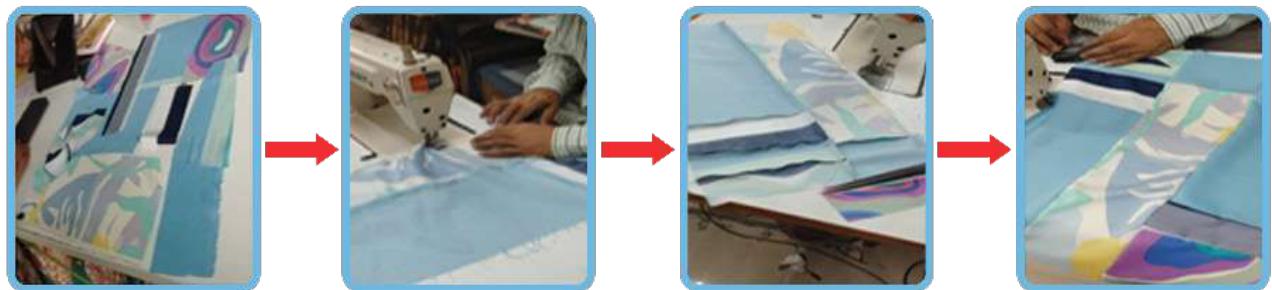


Fig. a

Fig. b

Fig. c

Fig. d

Collection of scarps and further sorting process is done by worker.

Fig. a. Scarps placed on the table as per design requirement.(Trial and error method)

Fig. b. Sent for stitching and making designer fabric from scarps.

Fig. c. Back side of the fabric where lining is attached if necessary.

Fig. b. Final sustainable fabric. Ready to use for sustainable product development

III. Transformation of chindi to Garments



Scrap



Fabric prepared from Scraps
(Sustainable Garment)

IV.



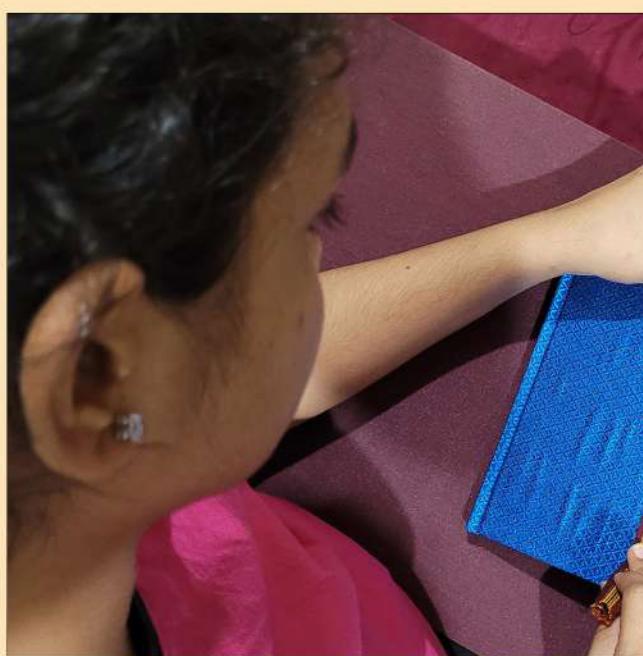
V. Transformation of chindi to Apparel

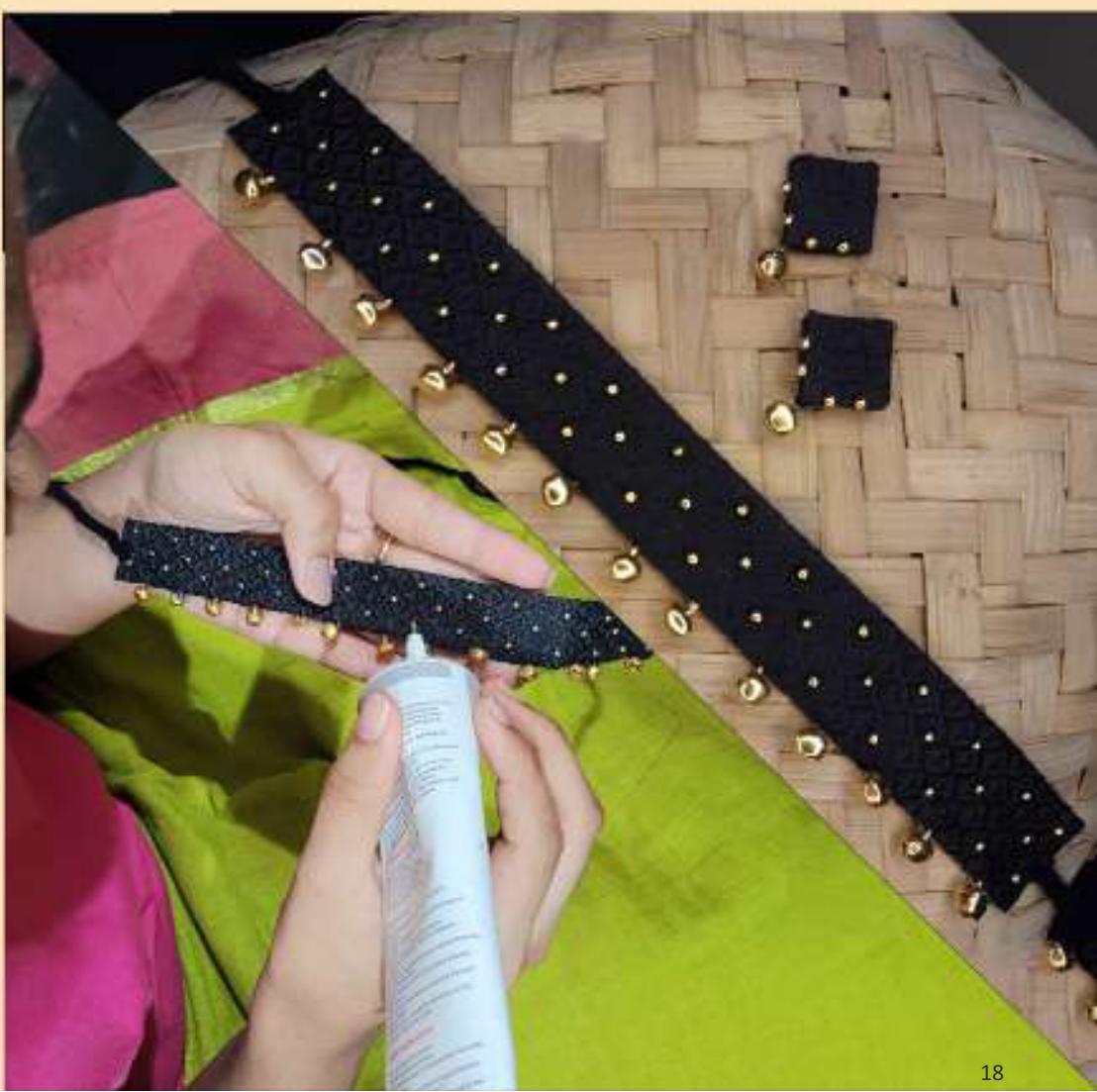


VI. Other Sustainable Textiles Products



Through the artful crafting of textile scraps, the beauty of sustainability and resourcefulness shines, inspiring the world where nothing is wasted and everything can be repurposed into something extraordinary.





5. Case Studies: Examples of few Sustainable Textile Companies

Here are a few examples of few sustainable textile companies' which manufactured sustainable products.

i. Bunko Junko: Bunko Junko is a sustainable fashion brand in Goregaon East, Mumbai, India. Smt. Bhavini Parikh is a remarkably committed social entrepreneur of India. She nurtured the idea of upcycling waste fabrics into garments, accessories, hand bags, toys, home furnishing, décor, daily life useful products and exhibited them. The company took up several challenges and has been successfully focusing on converting the waste of fabrics, scraps in realty development into commercially viable products while exercising friendly upcycling and manufacturing methods and giving employment for skilled manpower. Overall, Bunko Junko is a trailblazer in the sustainable fashion industry, showing that fashion can be both stylish and sustainable by using innovative approaches to upcycle textile waste.

ii. Doodlage Retail LLP: Doodlage is a sustainable fashion brand based in New Delhi, India, that upcycles textile waste into unique and stylish clothing. Doodlage recycles post consumer waste and post cutting scraps into new fabrics to create season-less well finished garments made for longevity. Waste is segregated and converted into accessories, soft furnishing products. All pieces and fabrics are made with ethical production units and packaging is designed to be plastic free.

iii. Artisanns Nest: Its aim to reduce carbon footprint with new designs with constant focus on reusing of existing material to increase its life span, upcycle and reclaim left over materials thereby minimizing wastage of any kind. All products are created out of pre-consumed textile waste. Their mission is to reduce the waste that gets landfilled or burnt off causing immense harm to the environment by creating products and services out of left over fabric.

These are just a few examples of sustainable textile companies that use Chindi's and textile scraps. By adopting these practices, these companies are creating unique and sustainable products, reducing textile waste, and supporting local communities and traditional textile techniques.



6. Supervisory Responsibilities:

- i. He/She should be aware about the basic concept of textile sector viz. fiber, yarn count, fabric type, colour, applications etc.
- ii. He/She should be aware of the scraps sorting process and best of the outcome.
- iii. He/She must be capable to direct, educate trainee for perfect sorting process.
- iv. He/She should be capable to design new product from raw material (scraps), designing, crafting, stitching, fusing etc.
- v. He/she should monitor overall process of crafting from starting to end.
- vi. He/She must be capable to direct, educate workers/ trainee for designing, process parameters, finishing related work.
- vii. He/she impart full creativity and use various techniques to develop the product.
- viii. He/She should be aware of the qualities of end product.
- ix. Supervisors analyze the production processes and identify opportunities for improvement. They work closely with the team to streamline workflows, optimize resource allocation, and implement more efficient techniques or technologies to increase productivity and reduce costs.
- x. He/She should be able to guide trainee about handling of machines or tools which are going to use.
- xi. He/She should aware about machine working, functions and their maintenance.
- xii. Proper housekeeping, it's necessity, how to direct the concerned people should be known by him/her.
- xiii. His/Her behaviour with juniors, transparency in directing, understand the duties, responsibilities should be reflected so that the trainees learn good working system.
- xiv. Supervisors develop production plans and schedules, considering factors such as order requirements, available resources, and production capacity. They organize the workflow, assign tasks, and set production targets to meet market demands.
- xv. A hard working man with determination, are also necessary for him so that he can create example with juniors who will follow him in positive direction.
- xvi. Supervisors are responsible for managing the team of artisans or craftsmen working in the textiles crafts industry. They hire, train, and mentor employees, ensuring they have the necessary skills and knowledge to perform their tasks effectively.
- xvii. Supervisors handle production issues, solve problems, and resolve conflicts that may arise within the team or between team members. They encourage open communication, mediate conflicts, and find solutions to ensure a harmonious work environment.
- xviii. Supervisor should report to upper management.
- xix. Supervisor should record the production data and other specific.
- xx. He/She should be responsible for marketing and increasing the sell.

A good supervisor leads by example, inspires teamwork, and empowers their team to achieve greatness.



7. Challenges and Opportunities for Sustainable Textile Recycling

While sustainable textile has many benefits, there are also challenges and opportunities that should be considered.

Challenges:

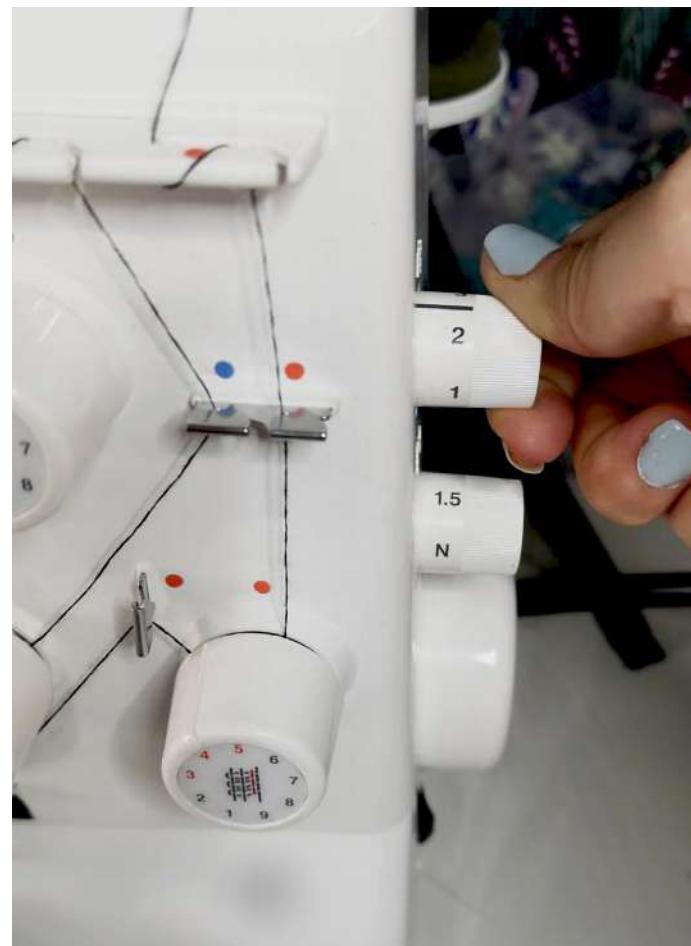
i. Availability of textile scraps: Unlike virgin textile, there are degrees of complexity and challenges related to the crafting from recycled textile. Textile recycling involves first step such as collecting waste textiles where pre- and post-consumer waste are collected through different channel. The challenging issue is with raw material supply, as the volume of textile waste cannot be guaranteed and retailers cannot ensure they will receive the same and/or similar items, this unpredictability of supply of textile waste is a great barrier in this field.

ii. Sorting of Scraps: Sorting of scraps is big challenge in this sector. It is a complex and labor-intensive task. Manufacturers receive mixed scraps with different fabrics (fibre content wise and/or colour wise), colors, textures, GSM, designs, buttons, zippers, metallic parts, and accessories, etc. To craft new products, the scraps need to be sorted according to specific design requirements. This involves separating them based on fabric type, color, texture, and design. For crafting a new products manufacturers have to sort the scraps manually as per design requirement and this is big challenge to sort such scraps from huge lot of scraps.

iii. Quality of raw material: One of the major challenges of sustainable textile recycling is the quality of the raw material. It can be difficult to control the quality of recycled material, as it may be contaminated with dirt or other materials, and may not meet the same quality standards as virgin materials.

iv. Cost of production and product: Recycling and repurposing textiles can often require additional processing steps, such as procurement, sorting, cleaning, designing, and crafting. These additional steps can increase the cost of production compared to production from virgin materials. The price of the end product can vary widely depending on factors such as the quality of the recycled materials, the complexity of the production process, time for manufacturing, involvement of skilled manpower and the level of demand from consumers. In some cases, sustainable textile products may be priced competitively with similar products made from virgin materials, while in other cases they may be priced at a premium. Ultimately, the success of sustainable textile recycling will depend on finding a balance between production costs and consumer demand.

v. Consumer awareness and behavior: While sustainable textile recycling can help reduce waste and conserve resources, consumer awareness and behavior play an important role in the success of this practice. Consumers may not always understand the importance of recycling textiles or may not prioritize sustainability when making purchasing decisions. Consumer awareness and behavior are critical to the success of sustainable textile recycling. Lack of awareness about the environmental impact and benefits of recycling, limited information on recycling options, and the prioritization of factors like price and convenience over sustainability can hinder progress. Additionally, emotional attachment to clothing and the disposable fashion culture pose challenges. Overcoming these barriers requires education, accessible information, promotion of the circular economy, and sustainability.



Opportunities:

- i. Skills add on:** Sustainable textile recycling presents opportunities for skill add on in the development of end product. Crafting is process that can improve the skill set and value addition of recycled materials.
- ii. Circular economy:** Sustainable textile recycling is a key component of the circular economy, which aims to reduce waste and create a closed-loop system where products and materials are reused and recycled.
- iii. Collaboration:** Sustainable textile recycling requires collaboration between various stakeholders, including manufacturers, consumers, and governments. Collaboration can help to develop effective policies and practices that support sustainable textile recycling.
- iv. Employability:** The scope of employability in crafting new sustainable textile products is significant and promising. As the world increasingly prioritizes sustainability and environmental consciousness, the demand for sustainable products have increased. This trend has created a range of employment opportunities for individuals skilled in the art of crafting sustainable textile products. Additionally, there is a growing need for experts who can analyze and implement sustainable practices across the textile supply chain, including sourcing raw materials, crafting processes, and waste management. With a combination of creativity, technical expertise, and a deep understanding of sustainability principles, individuals involved in crafting new sustainable textile products can contribute to a greener and more ethical future while enjoying fulfilling and impactful careers.
- v. Business Opportunities:** Crafting sustainable textile products offers abundant business opportunities. With growing consumer demand for eco-friendly goods/sustainable products, businesses can launch sustainable fashion brands, develop unique products to other businesses. By offering innovative and sustainable products, businesses can capture the attention of conscious consumers and differentiate themselves. Leveraging technology and collaborations with designers and retailers can expand their reach. Additionally, sustainable textiles can find applications beyond fashion, opening doors in sectors like a fashion industries, interior decorator, healthcare, etc. Embracing this market allows entrepreneurs to make a positive impact and create profitable ventures.

associated with the textile industry. While there are challenges that need to be addressed, there are also many opportunities for innovation, collaboration, and the development of a more sustainable textile industry.



Sustainable textile recycling has the potential to address many of the environmental and social challenges

8. Conclusion: The Importance of Sustainable Textile Products in a Circular Economy.

In conclusion, sustainable textile products play a critical role in a circular economy. As the fashion industry continues to grow, the need for sustainable, recycling and ethical practices is becoming current need of our society to sustain the environment. By embracing sustainable textile production and recycling practices, we can reduce waste, conserve resources, create job opportunities and preserve cultural traditions etc. The use of Chindi's and textile scraps in sustainable textile production is a promising example of this, as it not only offers environmental and social benefits but also allows creativity and unique products.

As consumers become more conscious of the impact of their purchasing decisions, companies that prioritize sustainable textile production and recycling practices will likely have a competitive advantage in the marketplace. In addition, advances in technology and innovation offer opportunities for further improvements in sustainable textile production, such as the development of new materials and production methods. Overall, the importance of sustainable textile products in a circular economy enhances sustainability. By working towards a more sustainable and circular fashion industry, we can create a better future for the environment, society, and economy.

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