Upcycling Textile Waste into Contemporary Fashion

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Abstract

The fashion and textile industry generates a considerable amount of textile waste during manufacturing, garment production, distribution and consumption. The increasing demand for fashion products and changing consumer preferences have contributed to the growing challenge of textile waste management. A significant portion of fabric leftovers, cutting scraps and rejected materials still has the potential to be used in new products rather than being discarded. This research explores the concept of upcycling textile waste into contemporary fashion products, with particular emphasis on pre-consumer cotton fabric scraps generated during garment production. The study focuses on identifying suitable textile waste materials available through garment manufacturing units, tailoring shops and boutiques in Bhopal, Madhya Pradesh. It examines how discarded fabric can be transformed into aesthetically appealing, functional and commercially relevant fashion products through creative design techniques. An exploratory and practice-based research approach is adopted, combining secondary literature with primary material observations and design experimentation. Techniques such as patchwork, appliqué, fabric manipulation, reconstruction, panel construction and surface embellishment are considered for developing contemporary fashion products. The research also explores the development of upcycled textile jewellery and accessories as an additional approach to material utilisation. The study highlights the importance of material selection, design innovation and responsible production in creating value from textile waste. It aims to demonstrate how fashion design can contribute to sustainable material practices while maintaining contemporary aesthetics, functionality and creative expression.

Keywords: Upcycling; textile waste; contemporary fashion; cotton scraps; sustainable fashion; circular economy; material innovation

1 Introduction

Fashion is an important part of everyday life, reflecting individual identity, culture, creativity and changing lifestyles. The development of the fashion industry has increased the demand for clothing and other textile-based products. However, the continuous production of garments also creates textile waste at different stages, particularly during fabric cutting, garment construction and finishing.

Textile waste includes unused fabric pieces, cutting scraps, rejected garments, leftover materials and discarded textile products. A considerable amount of this material may still possess useful physical and aesthetic qualities. However, when it is not properly collected, sorted or reused, it can become an unnecessary burden on waste-management systems.

Traditional fashion production generally follows a linear model in which raw materials are converted into products, consumed and eventually discarded. A more sustainable approach requires designers and manufacturers to consider how materials can remain useful for longer periods.

Upcycling offers one such opportunity. It involves transforming discarded or unwanted materials into new products with renewed functional and aesthetic value. Unlike conventional recycling, which may involve breaking materials down into fibres or other raw forms, upcycling can retain much of the original fabric structure and use its existing colour, texture and surface characteristics.

In contemporary fashion, upcycling can become a creative design approach rather than simply a waste-management activity. Through suitable construction techniques, discarded fabric can be transformed into garments, jewellery, accessories and other fashion products.

This research investigates the potential of using cotton fabric scraps from garment production in Bhopal as a resource for contemporary fashion development.

2 Background of the study

The increasing consumption of fashion products has created a need for more responsible approaches to textile production and material utilisation. During garment manufacturing, fabric is generally spread, marked, cut and stitched according to specific patterns. This process produces leftover materials in different shapes and sizes.

Some fabric pieces are too small or irregular for conventional garment construction but may still be suitable for patchwork, embellishment, accessories and other creative applications.

India has a long history of using leftover fabrics through traditional textile practices. Techniques such as Kantha embroidery, patchwork, Sujani and Chindi-based textile products demonstrate how existing materials can be given renewed purpose through craftsmanship.

According to the Ministry of Textiles, Government of India (2026), India's annual textile waste generation is estimated at approximately 7,073 thousand tonnes. The report identifies 2,973 thousand tonnes of pre-consumer waste and 4,100 thousand tonnes of post-consumer waste. It also identifies garment manufacturing as a major source of pre-consumer textile waste.

These national figures indicate the importance of improving textile material recovery and utilisation. However, national estimates should not be treated as the actual quantity of waste generated in Bhopal. Local material availability and waste-handling practices require separate observation and documentation.

3 Statement of the research problem

Textile waste generated during garment manufacturing is an important material-management challenge. Cotton fabric scraps and cutting leftovers are often separated from usable fabric and may be sold for low-value applications, stored without a defined purpose or discarded.

Although these materials may retain useful qualities, their irregular shapes, varying dimensions and mixed colours can make conventional garment production difficult.

There is a need to explore design-based methods through which such materials can be transformed into contemporary fashion products without depending entirely on newly purchased fabrics.

The research problem is therefore to investigate how pre-consumer cotton textile waste can be selected, processed and creatively transformed into functional and aesthetically appealing contemporary fashion products.

4 Aim of the study

To explore the potential of upcycling pre-consumer textile waste, particularly cotton fabric scraps, into contemporary fashion products through innovative design techniques and sustainable material practices.

5 Objectives of the study

1. To understand the concept of textile waste and its impact on the fashion industry.
2. To identify different sources and classifications of textile waste, with particular attention to pre-consumer waste.
3. To explore the availability of cotton fabric scraps from garment manufacturing units, tailoring shops and boutiques in Bhopal.
4. To study the physical and aesthetic characteristics of collected textile waste.
5. To examine suitable upcycling techniques for transforming leftover fabrics into contemporary fashion products.
6. To experiment with patchwork, appliqué, fabric manipulation, reconstruction and surface embellishment.
7. To develop fashion products and textile jewellery using selected waste materials.
8. To evaluate the creative, functional and production-related possibilities of upcycled fashion.
9. To encourage responsible material utilisation and sustainable design practices.

6 Research questions

1. What are the major sources of pre-consumer textile waste in garment production?
2. Why are cotton fabric scraps suitable for developing contemporary fashion products?
3. Which design techniques can effectively transform irregular fabric leftovers into useful products?
4. How can upcycling maintain contemporary aesthetics while utilising discarded materials?
5. What practical challenges are involved in collecting, sorting and using textile waste?
6. What opportunities does textile upcycling offer to fashion designers and small-scale fashion enterprises?

7 Literature review

7.1 Textile waste and the fashion industry

The fashion industry operates through several stages, including fibre production, fabric manufacturing, garment construction, distribution, consumption and disposal. Waste can be generated throughout these stages, making textile waste management an important concern for sustainable fashion.

The Ellen MacArthur Foundation (2017), in its report *A new textiles economy: Redesigning fashion's future*, explains the need to move away from the conventional linear textile system towards a circular model in which clothing, fabrics and fibres remain in productive use for longer periods.

The report provides an important foundation for understanding why fashion designers should consider material recovery and product life extension during the design process.

7.2 Traditional Indian textile practices

India has a rich heritage of textile craftsmanship that includes several techniques involving fabric reuse and decorative construction.

Singh and Rani (2021) discuss traditional Indian textile practices such as Kantha, Sujani, Namda, Gabba, patchwork and Chindi-based products. These techniques demonstrate how textile materials can be extended through stitching, layering, surface decoration and reconstruction.

Such practices provide useful inspiration for contemporary designers who wish to combine traditional craftsmanship with modern product development.

7.3 Research gap

Existing research discusses textile waste management, circular fashion, sustainable materials and different upcycling techniques. However, there remains a practical opportunity to investigate how locally available cotton cutting scraps in Bhopal can be systematically selected and transformed into contemporary fashion products.

This study addresses that area through material observation and practice-based design experimentation. It connects the identification of textile waste with its actual creative application in garment and jewellery development.

8 Classification and sources of textile waste

Textile waste can be broadly classified according to the stage at which it is generated.

8.1 Pre-consumer textile waste

Pre-consumer waste is generated before a textile product reaches the consumer. It includes leftover materials produced during textile and garment manufacturing.

Examples include fabric cutting scraps, leftover fabric rolls, rejected garment panels, unused production materials, fabric trimmings and manufacturing surplus.

8.2 Post-consumer textile waste

Post-consumer textile waste refers to clothing and textile products discarded after their use by consumers.

Examples include old garments, damaged clothing, discarded household textiles, unwanted fashion accessories and used textile products.

8.3 Industrial textile waste

Industrial textile waste includes discarded textile materials generated during industrial processing, such as yarn production, weaving, knitting, dyeing, finishing and other manufacturing activities.

9 Understanding reuse, recycling and upcycling

These three approaches are related to material recovery but differ in their processes and outcomes.

- **Reuse:** Existing products or materials are used again, usually without major transformation.

- **Recycling:** Waste materials are processed into fibres, raw materials or other usable forms for manufacturing new products.
- **Upcycling:** Existing waste materials are creatively transformed into new products with renewed functional, aesthetic or commercial value.

For this research, upcycling is the main approach because the selected cotton scraps can be used directly in design and construction without necessarily breaking them down into fibres.

10 Upcycling techniques in contemporary fashion

10.1 Patchwork

Patchwork involves joining different fabric pieces to create a larger textile surface. It is particularly suitable for cotton scraps of different sizes, colours and patterns.

10.2 Appliqué

Appliqué is a decorative technique in which fabric shapes are attached to a base fabric through stitching or other suitable construction methods.

10.3 Fabric manipulation

Fabric manipulation involves changing the surface or structure of a textile through techniques such as pleating, gathering, folding, twisting, tucking and layering.

10.4 Fabric reconstruction

Fabric reconstruction involves taking existing fabric pieces or discarded garments apart and reorganising their components into new forms.

11 Research methodology

11.1 Research design

The study adopts an exploratory and practice-based research design. It combines theoretical investigation with practical material selection and design development.

The exploratory component helps in understanding textile waste, its sources and its suitability for fashion applications. The practice-based component focuses on experimenting with selected waste materials and developing new products through different design techniques.

11.2 Primary data collection

Primary information for this research is based on the researcher's direct involvement in identifying, collecting, observing and experimenting with textile waste.

The following activities form the primary research process:

- Observing the availability of cotton fabric scraps from local garment-related sources;
- collecting suitable fabric leftovers;
- examining fabric quality, colour, texture, size and condition;
- separating reusable pieces from damaged or unsuitable materials;

- recording the material characteristics;
- experimenting with different upcycling techniques;
- developing fashion products and textile jewellery;
- observing construction difficulties and material limitations.

11.3 Secondary data collection

Secondary information is obtained through published research papers, books, government reports, academic journals, credible websites and existing studies related to textile waste, sustainable fashion and upcycling.

The major areas of secondary research include:

- Textile waste classification;
- sustainable and circular fashion;
- cotton fabric characteristics;
- textile waste management;
- traditional Indian textile techniques.

12 Selection of textile waste material

12.1 Selection of cotton fabric scraps

Cotton fabric scraps were selected as the primary material for this research because of their practical suitability for fashion product development.

Cotton is a widely used natural textile material that is available in different weights, colours, textures and fabric constructions. Cutting scraps generated during garment production can therefore provide a variety of material possibilities for creative experimentation.

Another important reason for selecting cotton scraps is their versatility. They can be stitched, layered, folded, gathered, joined and decorated through different design techniques. This makes them suitable for developing garments, surface details, textile jewellery and accessories.

The availability of different fabric dimensions also encourages design flexibility. Larger pieces can be considered for garment panels, while smaller pieces can be utilised for patchwork, appliqué and decorative elements.

The selection also supports the main objective of this research, which is to explore the conversion of production leftovers into useful contemporary fashion products.

12.2 Material segregation

After collection, the cotton scraps are separated according to their size, colour, texture and condition.

Larger pieces can be considered for garment panels and reconstruction, while medium-sized pieces can be used for patchwork and appliqué. Smaller pieces may be suitable for textile jewellery, decorative details and surface embellishment.

13 Design development and practical experimentation

Design development is an important part of the research because it demonstrates how textile waste can be transformed through creative decision-making.

The process begins with observing the collected materials and identifying their possible applications. Instead of following a conventional design process in which fabric is purchased according to a predetermined pattern, the designer considers the available fabric dimensions and characteristics while developing the product.

13.1 Design inspiration and concept development

The design inspiration is developed through the visual and physical qualities of the selected cotton scraps. Their colour combinations, textures, irregular edges and existing patterns can be used as starting points for contemporary design concepts.

The objective is to create products that maintain a balanced relationship between material utilisation, functionality and visual appeal.

13.2 Garment development

Cotton fabric scraps can be arranged and combined to develop contemporary garment structures.

The process may include:

- Selecting suitable fabric pieces;
- developing a colour and texture combination;
- preparing garment design sketches;
- arranging fabric pieces according to pattern requirements;
- joining selected panels through stitching;
- adding decorative details where appropriate;
- checking fit, comfort and construction quality.

14 Results and discussion

The research establishes a design-based approach for examining the potential of cotton textile waste in contemporary fashion development.

The literature review indicates that pre-consumer textile waste represents an important material stream within the textile industry. The Ministry of Textiles (2026) estimates India's pre-consumer textile waste at approximately 2,973 thousand tonnes annually. Within this category, garmenting waste is estimated at 1,850 thousand tonnes.

These national figures highlight the importance of investigating garment-production leftovers as potential design resources.

From a material perspective, cotton scraps offer several creative possibilities because they can be combined through stitching, layering, reconstruction and surface decoration. Their varying dimensions encourage designers to adapt garment patterns and product forms according to the available material.

The practical development of upcycled textile jewellery also demonstrates the possibility of extending the application of fabric waste beyond apparel.

15 Challenges and limitations

Although textile upcycling offers several creative possibilities, the process also involves practical limitations.

15.1 Irregular fabric dimensions

Cutting scraps are often available in different shapes and sizes, making conventional pattern planning difficult.

15.2 Material availability

The quantity, composition and quality of waste materials may vary according to production requirements and seasonal demand.

15.3 Fabric condition

Some pieces may have stains, damaged edges, weak structures or unsuitable finishes that restrict their use.

15.4 Time and labour

Sorting, measuring, joining and finishing individual scraps may require additional time compared with working with continuous fabric lengths.

15.5 Product durability

The strength of seams, fabric combinations and supporting materials must be assessed to ensure that the final product is suitable for its intended purpose.

15.6 Commercial feasibility

Upcycled products may involve additional design and construction labour. Their pricing and market acceptance therefore require careful consideration.

15.7 Research limitations

The study is focused on selected cotton scraps and a specific local context. Its findings should not be generalised to all textile waste categories or manufacturing regions.

16 Conclusion

Upcycling textile waste into contemporary fashion presents an opportunity to combine creative design with responsible material utilisation. Instead of treating leftover fabric as an unusable by-product of garment production, designers can explore its potential as a resource for developing new fashion products.

This research focuses on pre-consumer cotton fabric scraps and examines their suitability for garment construction, surface development, jewellery and accessories. Through techniques such as

patchwork, appliqué, fabric manipulation, reconstruction and panel construction, textile leftovers can be transformed into products with renewed functional and aesthetic value.

The study also highlights the importance of understanding the characteristics of available materials before beginning the design process. Material selection, appropriate construction techniques, finishing and durability all influence the quality of the final product.

The exploration of upcycled textile jewellery further demonstrates that textile waste has applications beyond clothing and can contribute to innovative fashion accessories.

References

[1] Aus R, Moora H, Vihma M, Unt R, Kiisa M, Kapur S (2021). Designing for circular fashion: Integrating upcycling into conventional garment manufacturing processes. *Fashion and Textiles*, 8, 34. https://doi.org/10.1186/s40691-021-00262-9

[2] Ellen MacArthur Foundation (2017). A new textiles economy: Redesigning fashion's future. *Ellen MacArthur Foundation*, Cowes. https://www.ellenmacarthurfoundation.org/a-new-textiles-economy

[3] Kamble Z, Behera BK (2022). Upcycling textile wastes: Challenges and innovations. *Textile Progress*, 53(2), 65–122. https://doi.org/10.1080/00405167.2021.1986965

[4] Ministry of Textiles, Government of India (2026). Mapping of textile waste value chain in India: A comprehensive look at India's textile waste ecosystem. *Government of India*, New Delhi. https://www.texmin.gov.in/static/uploads/2026/03/407c2f186a2044a4497c9c9803d16a2c.pdf

[5] Singh S, Rani J (2021). Traditional Indian textile techniques used to upcycle and recycle textile waste. *Textile & Leather Review*, 4, 336–353. https://doi.org/10.31881/TLR.2021.29

[6] United Nations Environment Programme (2023). Sustainability and circularity in the textile value chain: A global roadmap. *UNEP*, Nairobi. https://wedocs.unep.org/handle/20.500.11822/42580