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Utilising Upcycled Jute Fibre in the Development of Sustainable Home Décor Accessories: A Practice-Based Exploration

*Ayuba Rejoice Betimaniu, Mary Lawan, Solomon Gausa

Department of Industrial Design, Modibbo Adama University, Yola, Nigeria

*Corresponding Author: ayubarejoice0@gmail.com; 07048995202

ABSTRACT

This study investigates the utilisation of jute as a sustainable and eco-friendly material for interior decoration, highlighting its potential to replace synthetic materials that contribute to environmental degradation. As global awareness of sustainability and resource conservation intensifies, jute, a natural fibre obtained from the *Corchorus* plant, emerges as a viable alternative due to its biodegradability, renewability, and minimal environmental footprint. The research examines the fibre's properties, including its tensile strength, versatility, and aesthetic adaptability in various interior applications such as furnishings, floor coverings, and wall décor. The study used a practice-based research design to produce some interior decoration accessories through an iterative process. The study findings revealed that jute's production process requires fewer inputs, promotes carbon sequestration, and supports socio-economic development through local employment. By integrating jute into interior design, this study demonstrates the material's contribution to circular economy principles, environmental stewardship, and sustainable design practices. The study concludes that jute represents a promising pathway toward eco-responsible and resource-efficient interior decoration.

Keywords: jute fibre, sustainable design, interior decoration, eco-friendly materials, circular economy, environmental conservation.

INTRODUCTION

As heavy industrialization and globalization became a phenomenon in the 21st century, they brought huge benefits such as availability, remarkable adaptability, versatility, durability, making life and living standards colourful, there has also been a rise in concerns and criticism of the effects in the large-scale use of synthetic products on the ecosystem, which in effect plays a synergistic role in our everyday living and longevity. The excessive use of synthetic fibres, plastics, and non-biodegradable materials contributes to environmental degradation and poses sustainability challenges. In view of this, there is a pressing need to identify alternative materials that not only enhance the aesthetics of interior spaces but also align with the principles of sustainability.

To address this issue, exploring materials that are both sustainable and eco-friendly is crucial. Hence, this paper aims to explore the use of jute as a sustainable and eco-friendly material for interior decoration, focusing on its versatility, durability, and eco-friendly properties. The concern for the environment is increasing day by day, and that makes people more interested in researching and keeping up to date with environmentally friendly and sustainable materials and products for everyday use.

Sustainability, industrial ecology, eco-efficiency and green chemistry are guiding the development of the next generation of materials, products and processes in various sectors and industries worldwide. Interior decoration has a profound impact on the environment due to the choice of materials used for designs, especially the widespread use of synthetic materials like plastics and polyesters, which leads to environmental pollution affecting both life on land and water, mostly due to their inability to be degraded, and even waste management issues.

In response to industry awareness on the negative impact of these choice materials, designers and manufacturers are leading the trends in research and development of eco-friendly materials, with researchers being interested in seeking out ideal and eco-friendly materials with the potential to replace synthetic variants while retaining quality standards and aesthetic characteristics. Due to their low carbon footprint, natural fibre-based products are attracting significant attention among academic and industrial researchers for sustainable product development (Shahinur *et al.* 2022). Compared with the synthetic fibres, natural fibres (Arpitha & Yogesha, 2017) have many advantages due to their abundance, availability, and low cost (Madhu *et al.*, 2019b).

Natural fibres are scientifically considered as recyclable, biodegradable, and ultimately eco-friendly in nature. Interior decoration products that are made of jute and other natural fibres can be intrinsically interlinked with sustainable development. If such products are promoted and are used through planning and innovation, they can effectively act as instruments in reviving the misplaced ecological balance (Ruchita 2020). Jute is a versatile natural fibre that can be used in a variety of ways in interior design. Recently, Jute fibre has been getting popular due to its eco-friendly characteristics. In terms of usage, global consumption, production, and availability, it is the second most important vegetable fibre after cotton.

By reducing reliance on materials with high-carbon footprints, such as plastics and synthetic fibres, the study supports efforts towards a more sustainable and eco-friendly design approach. Jute cultivation requires fewer resources compared to the production of synthetic fibres and materials. And its production is inherently carbon-neutral and contributes to carbon sequestration in the soil, making it a more environmentally friendly option compared to materials with high carbon footprints.

The significance of exploring the use of jute as a sustainable, eco-friendly material for interior decoration extends beyond its aesthetic appeal. It encompasses environmental stewardship, resource conservation, socio-economic development, and the promotion of sustainable design practices, ultimately contributing to a more sustainable and resilient built environment. The study helps reduce the overall carbon footprint associated with the production and use of interior decoration materials by incorporating jute into interior decoration practices. It encourages designers, architects, and manufacturers to adopt sustainable design practices by incorporating eco-friendly materials such as jute into their projects, thereby showcasing the versatility and aesthetic appeal of jute in interior design.

NATURAL FIBRES

Natural fibres are raw materials derived from plants, animals, or minerals. They are categorised into plant-based (like cotton and linen), animal-based (like wool and silk), and mineral-based (like asbestos) fibres. These fibres are spun into threads and yarns to create textiles, paper, and other materials. Natural fibres like jute are gaining momentum in modern society because of the increased concerns about the impact of global warming, climate change, and sustainability rather than wastage. Recently, due to the improvement of people's living standards and need for environmental

protection, the demand of natural biodegradable and eco-friendly fibres is rising worldwide day by day.

Jute is an environmentally accepted fibre globally. Jute is a natural fibre mostly cultivated in the South Asian parts of the world. It is a naturally grown fibre crop which is environmentally friendly and biodegradable. It is considered the second most important vegetable fibre after cotton. The jute fibre is characterised by properties of high tensile strength; it has low extensibility and is a breathable fabric. It is extensively used as a packaging material. Other applications of jute include its usage in the textiles, construction, and agricultural sectors. It is used in developing high-quality industrial yarn, fabric, net, and sacks.

Jute has also found its usage in the automobile sector with increased research and innovation (Alves *et al* 2010). Presently, with the increased awareness of the harm done by plastic to the environment, it's high time to push the diverse potential uses of jute in industrial and domestic use. Jute is one of the most adaptable natural fibres, and the idea of using it as a material for interior decoration is a highly welcomed innovation. According to a 2023 online report published by The Embassy of Bangladesh, jute has many advantages as a home textile, either replacing cotton or blending with it. It is a strong, durable, colour-fast fibre.

Its UV protection, sound and heat insulation, low thermal conduction and anti-static properties make it a wise choice in home decor. In addition, fabrics made from jute fibres are carbon dioxide-neutral and naturally decomposable. These properties can also be used in high-performance technical textiles. It has high tensile strength, low extensibility, and ensures better breathability. Jute goods are widely and commonly used for designing products and for aesthetic and functional purposes. Especially for wall decoration, different items of jute are embroidered paintings, framed products, framed photographs, tapestries, framed mirrors, wall decals, wall-hangings, hacking pockets storage, key holders, etc.

Indoor containers for planting young trees, which can be planted directly in the container without disturbing the roots (Embassy of Bangladesh, 2023). Jute fibres are also woven into curtains, chair coverings, hessian cloth, jute cushion covers, jute fabrics, and jute blinds. Diversified jute products are becoming increasingly valuable to the consumer today. Among these are floor coverings, home textiles, high-performance technical textiles, composites, and more. Jute floor coverings consist of

jute mats and durries, woven, tufted, and piled carpets.

Jute Mats and mattings with 5/6 meters width and of continuous length are easily woven, in solid and fancy shades, and in different weaves like Boucle, Panama, Herringbone, etc. Jute Mats & Rugs are made both through Power loom & Handloom (Embassy of Bangladesh, 2023). The industrial term for jute fibre is raw jute. The fibres are off-white to brown and 1–4 meters (3–13 feet) long. Jute is also called the “golden fibre” for its colour and high cash value. The bulk of the jute trade is centred in South Asia, with India and Bangladesh as the primary producers. Rough fibre made from the stems of a tropical old-world plant, used for making twine and rope or woven into sacking or matting.

With increasing environmental awareness, eco-friendly and biodegradable products are gaining popularity both in developed and developing countries for retardation of ecological balances and reduced degradation due to greenhouse effects. Jute and jute products not only retard ecological degradation but also conserve the environment and atmosphere. At present, many technologies and processes are available for the commercialisation of jute diversified products (JDPs). Adoption of newly developed and improved technologies and processes for the production of high-value jute diversified products and the alternative use of jute.

According to John and Anandjiwala (2008), among different natural fibres, jute fibres are easily obtainable in fibre and fabric forms with good thermal and mechanical properties. The inborn properties of jute fibre, such as low density, high tensile modulus and low elongation at break and its specific stiffness and strength comparable to those of glass fibre, draw the attention of the world (S. Taj, 2007). Over hundreds of years, it has been used in the applications of ropes, beds, bags, etc. High-quality and new uses of this fibre can create more job opportunities in the rural sector (Mwaikambo, 2006).

As jute is an environmentally friendly material, it has no negative impact on the environment. For example, if mobile covering, computer covering, and television covering are made with jute, it will be most effective for the environment because when the lifetime of these devices will be invalid, it is released into the land and as a result, the fertility of the land will not decrease. Doing so with synthetic material destroys the production capability of the land. Also, if we make tables from jute composite, it will minimise the pressure on wood, which is most effective for our environment. When jute bags are

used as a substitute for polythene bags, it does not harm the soil as done by polyethylene.

Jute is often referred to as the golden fibre, a name attributed to it due to the golden and silky shine of the fibre. According to a 2018 publication by the Food and Agriculture Organisation of the United Nations, the cultivation of jute is extensively done in India and Bangladesh. More than 99 per cent of the world’s jute cultivation is located in these two countries. Other countries that produce jute are Myanmar, Thailand, Nepal and Uzbekistan. The crop is cultivated as a commercial crop which grows in a hot and humid climate. India is a major cultivator of jute. Most of the jute cultivation in India is concentrated in the Ganga delta region. Jute, being a rain-fed crop, needs adequate rainfall.

JUTE

Jute, a natural fibre derived from the stem of the jute plant, possesses several characteristics that make it a promising alternative for sustainable interior decoration. (Brute Jute, 2019) Jute is produced from plants in the genus *corchorus*, which was once classified with the family *tiliaceae*, more recently with *malvaceae*, and has now been reclassified as belonging to the family *sparrmanniaceae*. Jute plants are grown in agricultural fields, which must pass through some specific processes over a duration to finally obtain the fibre. It is biodegradable, renewable, and requires minimal chemical processing during production.



Fig 1. Unravelling Jute strands sourced from used jute sacks, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

However, despite its potential, there remains a lack of comprehensive understanding regarding its application, durability, aesthetic appeal, and overall suitability for interior decoration purposes. Jute is called the golden fibre of Bangladesh. Nowadays, it is also used as an interior material. The industrial term for jute fibre is raw jute. The appearance of the fibre is usually off-white to brown in colour and 1–4

meters (3–13 feet) long. Jute is also called the “golden fibre” for its colour and cash value.

TYPES OF JUTE

There are many types of jute, each with distinct characteristics that influence its application and performance. Among them, a few highlighted varieties are:

White Jute (*Corchorus capsularis*): White jute isn't anywhere near as popular as it once was, but historical records suggest that this fabric used to be the main textile used to clothe the common people of the Bengal region of India. As its name suggests, white jute is lighter in colour than other strains of this fibre, but this type of jute is also less durable than its cousins. (Sewport support team, 2023: online).

Tossa Jute (*Corchorus olitorius*): Tossa jute is the main type of jute in production today. It is a hardy crop, and it yields more fibre than white jute. In colour, Tossa jute is browner than off-white, and its fibres are just as long and strong as any other type of jute in existence. (Sewport 2023).

Mesta Jute: Mesta jute is a hybrid of white jute and Tossa jute. While this type of jute wasn't popular historically, political complications during India's tumultuous independence period led to the prominence of this type of jute's production. (Sewport 2023).

Jute Cuttings: Jute cuttings are by-products of jute production. They are the roughest and least desirable parts of the jute plant, but they can still be used to make rudimentary textiles. (Sewport 2023).

JUTE PROCESSING

Jute plants are about 15-20 cm tall. Four months after planting, harvesting begins. The stalks are cut off close to the ground. The stalks are tied into bundles and soaked in water for about 20 days. The fibres are then stripped from the stalks in long strands and washed in clear, running water. Then they are hung up or spread on thatched roofs to dry. After 2–3 days of drying, the fibres are tied into bundles. The ideal climate for growing jute is warm and wet conditions, which are offered by the monsoon climate during the fall season, immediately followed by summer. Jute requires 2–3 inches of rainfall weekly, with extra needed during the sowing period. Retting is the process of extracting fibre from the long-lasting life stem or bast of the plants. (Brute Jute, 2019)

Jute plant bundled for Retting: After harvesting, the jute stalks are tied into bundles and submerged in soft running water. Stalk stays are submerged in water for 20 days. (Brute Jute, 2019)

Retting Stage: In most cases, the fibre extraction process of bast fibres in water retting is done by the farmers while standing underwater. When the jute stalk is well retted, the stalk is grabbed in bundles and hit with a long wooden hammer to loosen the fibre from the jute core. (Brute Jute, 2019)

Cleaning the Jute fibre: After loosening the fibre, the fibre is washed with water to complete the cleaning process and squeezed for dehydration (Brute Jute, 2019)

Drying the Jute fibre: The extracted fibres are further washed with fresh water and allowed to dry on bamboo poles. Finally, they are tied into small bundles to be sold to manufacturers. (Brute Jute, 2019)

Interior decoration

According to Wiley (2006), interior decoration is a process that offers its clients a selection of functional yet attractive options for a better use of the area in issue. By better utilising the space present in the intervening environment, interior decoration aims to enhance the user experience. The professionals in charge of the interior decoration of your home or place of business assess it, pay attention to your demands, and consider choices that maximise its use based on what you desire for each division. In essence, it is a method of enhancing the quality of life for those who inhabit or enjoy a particular location through design and decoration. Interior decorators, who are qualified through training, experience, and certification, have a moral and ethical duty to safeguard clients and build occupants by creating inclusive interior spaces that address well-being and consider the complex physical, mental, and emotional needs of people.

PROPERTIES OF JUTE SUITABLE FOR INTERIOR DECORATION

As jute is an environmentally friendly material, it has no negative impact on the environment. It will be most effective for the environment because when the lifetime of these devices is over, they are released into the land, and as a result, the fertility of the land will not decrease. Doing so with synthetic material destroys the production capability of the land. Also, if we make tables from jute composite, it will minimise the pressure on wood, which is most effective for our environment. When jute bags are used as a substitute for polythene bags, it does not harm the soil as done by polyethylene.

In recent years, jute has gained popularity as an eco-friendly alternative to synthetic materials or wood and wood-based products such as particleboard and

MDF (medium-density fibreboard). However, jute can replace synthetic materials in interiors in various ways.

- a) **In terms of sustainability**, Jute is a renewable resource that is biodegradable and compostable, making it an eco-friendly alternative to synthetic materials and wood-based products. The production of synthetic materials requires non-renewable resources such as petroleum, which has a negative impact on the environment.
- b) **In terms of cost**, Jute is a cost-effective material that can be produced at a lower cost than synthetic materials. This makes it an attractive option for manufacturers looking to reduce their production costs. e.g.- A jute rug can be manufactured at a lower cost than any synthetic rug.
- c) **Its versatile character**: Jute can be used in a variety of applications such as packaging, textiles, and construction materials. Its versatility makes it an ideal replacement for synthetic materials that are limited in their applications.
- d) **Durable essence**: Jute fibres are strong and durable, making them suitable for use in construction and furniture-making. Jute boards can withstand heavy loads and are resistant to moisture and pests.
- e) **Aesthetic value**: Jute has a natural, rustic look that can add warmth and texture to interior spaces. It can be finished in a variety of ways, including staining, painting, or laminating, to achieve a different look.

METHODOLOGY

Research Design

This study adopts a practice-based research design, aligning with Sullivan (2010) and Smith & Dean (2009), which positions creative making as the main method for generating new knowledge. The project is grounded in studio-based practice, reflective documentation, and iterative development of

environmentally friendly interior decoration from jute fibre.

The research used an iterative design process, where multiple prototypes were developed, tested, and refined. Each stage of the design process informed the next, ensuring continual improvement of both form and function. All stages were systematically documented, including design sketches and production steps, with evaluations carried out at different stages to test the prototypes, providing a clear record of how each prototype was developed. Feedback from peers and users also informed the research design.

Materials, Tools, and Equipment

Materials were sourced locally within Yola metropolis to promote accessibility and sustainability. Materials and tools used include:

- i. **Used Jute sack**: This is an already-woven jute product mostly used for storage. The used jute sacks were selected due to the limited availability of jute ropes.
- ii. **Jute ropes**: Extracted from the sourced jute sack.
- iii. **Sewing thread/Needles**: To stitch the jute patterns together.
- iv. **Scissors**: For cutting measured pieces.
- v. **Measuring tape**: For measurement of various lengths.
- vi. **Pencil and Paper**: For sketches and delineations.
- vii. **Fabric Lining**: To enhance the durability of the pieces.
- viii. **Glue Gun/Glue Stick**: A glue gun and glue sticks were utilised to securely attach and finish the jute decorative items, providing a strong bond and durable hold without compromising the natural aesthetic of the sustainable materials.

Table 1 highlights and summarises the properties of jute that are suitable for interior decoration and relevant to the study. The fibres' durability ensures long-lasting décor items due to their biodegradable nature, which supports sustainability goals.

Table 1: Material Properties of Jute fibre

Property	Characteristics	Relevance
Durability	High tensile strength	Ensure long-lasting décor items
Malleability	Ease in shape forming and manipulation (braiding, coiling)	Suitable for the creative design process
Drape	Flexible	Falls naturally and enhances the aesthetic appeal of décor items
Colour fastness	Retains dye effectively with minimal fading	Supports the use of vibrant colours
Texture	Rough and natural texture	Enhances natural, eco-friendly aesthetics.
Biodegradability	Decomposes naturally	Promotes sustainability goals

Procedures used in the production of jute interior decoration prototypes

The procedure for creating jute interior decoration prototypes using jute ropes involves several key steps:

1. Design Planning: Preliminary sketches were drawn to visualise intended items. Refinements were applied based on evaluation and feedback to improve form and function.

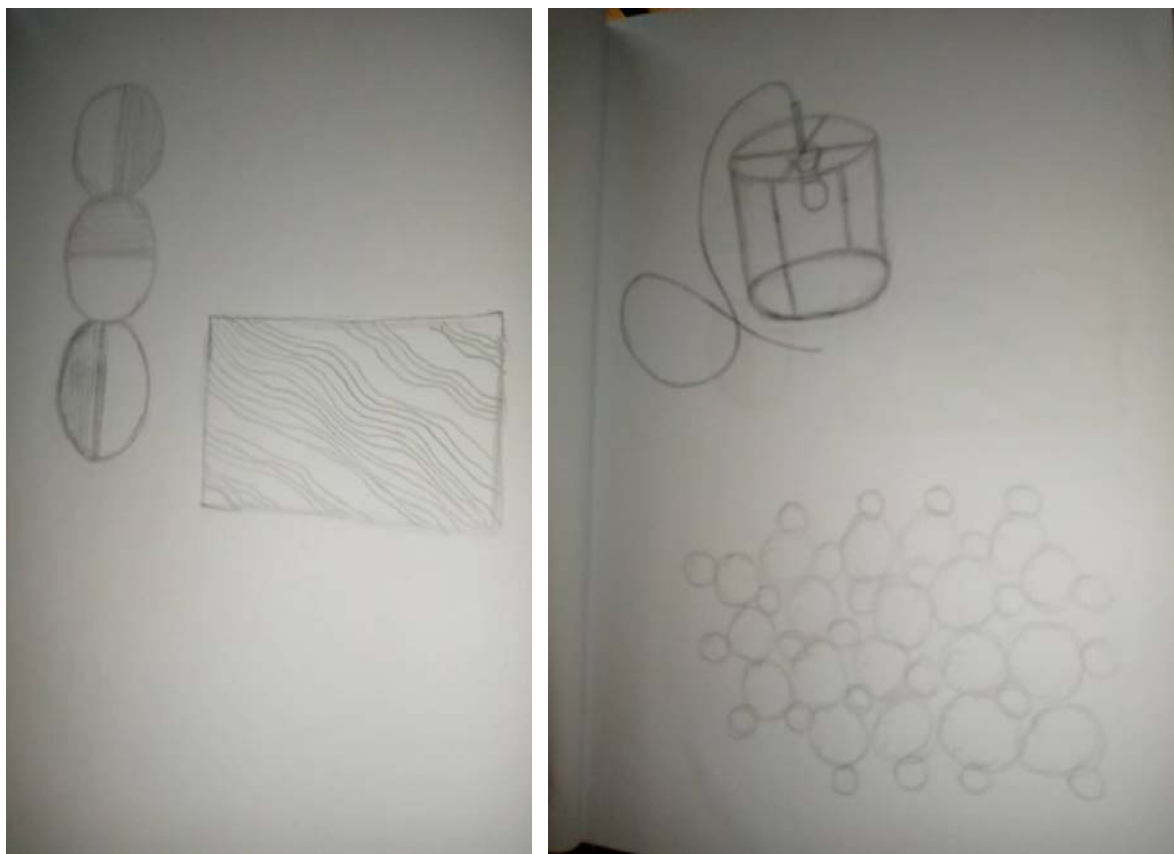


Fig 2. Preliminary design sketches to visualise intended décor items, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

2. Collection: Used jute sacks were gathered and sorted for quality.



Fig 3. Collected and sorted used Jute sacks ready for unstitching, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

3. Unstitching: The sacks were unstitched at the seams to facilitate fibre extraction



Fig 4. Unstitched Jute sack ready for unravelling, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

4. Unravelling: The sacks were unravelled into individual yarn strands.



Fig 5. Unravelled Jute strands after fibre extraction, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

5. Carding: The yarns were carded to align the fibres and improve uniformity. Progressive carding ensured consistent fibre quality.



Fig 6. Uniform and aligned Jute strands after carding, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

6. Spinning: The aligned fibres were spun to form jute ropes. Iterative trials ensured consistency in thickness and strength.



Fig 7. Spun yarns ready for braiding and twisting, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

7. Twisting & Braiding: The ropes were twisted and braided to the desired thickness for variety. Variations were tested repeatedly and refined.



Fig 8. Twisted & Braided Jute ropes in varying thickness for variety, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

8. Dyeing: The jute ropes were dyed using selected colours (black, orange and green). [Adjustments ensured colour fastness, uniformity and aesthetic appeal]



Fig 9. Jute ropes dyed in green, orange, and black colours for variety, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

9. Product Manufacturing: The dyed ropes were manipulated through coiling and stitching to form decorative items such as wall hangings, rugs, and chandeliers. Each prototype was evaluated and refined based on durability, aesthetics, functionality, material efficiency, and feedback



Fig 10. Production process of the prototypes through manipulation of the ropes by coiling and stitching, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

Table 2 summarises the production stages from the design planning to the product manufacturing, describing each process and the outcome of each stage.

Table 2: Production stages of jute décor prototypes

Production stage	Process description	Outcome
Design Planning	Sketching of décor items	Visual guide for production
Collection	Gathering and sorting of used sacks	Raw material selection
Unstitching	Opening seams of sacks	Preparation for fibre extraction
Unraveling	Separating jute fibres	Individual fibres obtained
Carding	Aligning jute fibres	Improved fibre consistency
Spinning	Twisting fibres into ropes	Formation of usable jute ropes
Twisting/Braiding	Structuring ropes to the desired thickness	Variety in texture and form
Dyeing	Applying colour to ropes	Enhanced visual appeal
Product Manufacturing	Coiling and stitching into décor items	Production of final prototypes

Evaluation Criteria:

Each prototype was evaluated using the following explicit criteria:

- a) Durability: the strength of stitches and rope structure was tested to ensure items withstand handling and intended use.
- b) Aesthetics: symmetry, colour uniformity, and overall design balance were ensured in prototypes.
- c) Functionality: performance of items was tested in intended settings; wall hangings were mounted to ensure they draped well and rugs were laid to ensure flat placement.
- d) Material Efficiency / Sustainability: minimum amount of jute was used to minimize waste and ensure sustainability.
- e) Feedback Incorporation: Insights from peers and informal users regarding appearance, usability, and satisfaction guided iterative development of prototypes.
- f) Observations included stitch strength, rope malleability, drape, colour fastness, and

overall visual appeal. Iterative refinements were applied to each subsequent prototype based on these criteria and feedback.

APPLICATIONS OF JUTE IN INTERIOR DECORATION

Jute uses in daily life create gorgeously comfortable living spaces without fuss or clutter. In recent years, jute has become increasingly popular in interior design due to its eco-friendliness, durability, and versatility. It can be used as an alternative to various interior materials that are harmful to the environment (Tahmid, 2023). Jute wallpaper is an eco-friendly alternative to traditional wallpaper. It can add depth and dimension to any room, creating a warm and inviting atmosphere. Decorative accessories such as wall frames, tapestries, chandeliers, storage pockets, and plant containers are produced using jute. These products demonstrate the creative adaptability of jute and its ability to be both artistic and functional.



Fig 11. Prototype 1: Jute chandelier, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024



Fig 12. Prototype 2&3: Jute wall frames, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024



Fig 13. Prototype 4: Jute rug, Medium: photography, Source: Ayuba Rejoice Betimaniu 2024

DISCUSSION

The exploration of jute fibre as a sustainable material for interior decoration highlights its significant potential within contemporary design practices. Jute's inherent properties, including high tensile strength, malleability, and aesthetic appeal, make it suitable for a wide range of decorative applications. These findings are consistent with practice-based research approaches that emphasize material exploration and creative production as sources of knowledge generation (Smith & Dean, 2009).

Additionally, studies on natural fibre composites indicate that plant-based fibres such as jute possess favourable mechanical properties, biodegradability, and low environmental impact, supporting their use as sustainable alternatives to synthetic materials (Faruk et al., 2012).

The biodegradable and renewable nature of jute aligns with the growing global emphasis on sustainable interior design. Sustainable design research highlights the importance of renewable materials in reducing environmental degradation and promoting eco-conscious practices (Fletcher, 2014). The adoption of jute fibre, therefore, contributes to reducing dependence on petroleum-based synthetic materials, minimising

environmental pollution, and supporting sustainable production practices.

However, despite these advantages, several challenges were identified. These include processing limitations, particularly the labour-intensive conversion of jute sacks into usable ropes, as well as the limited availability of pre-processed jute materials. Similar constraints have been identified in natural fibre research, where issues of fibre consistency, processing efficiency, and scalability affect broader industrial adoption (Pickering et al., 2016).

Additionally, the absence of standardised production techniques may result in inconsistencies in product quality. Addressing these challenges through technological advancements, improved processing techniques, and collaboration between designers, manufacturers, and researchers could enhance scalability and broader market acceptance of jute-based interior décor products.

Production Process

The production process of transforming jute sacks into sustainable interior decoration materials spanned approximately six to eight weeks. Due to the unavailability of jute ropes, used jute sacks were collected, sorted, unstitched, unravelled into yarns, carded, and spun into jute ropes.

The jute ropes were then twisted to the desired thickness, naturally dyed (black, orange, and green), and transformed into decorative items (wall hangings, rug, and chandelier) through coiling and stitching into sketched patterns.

This upcycling process not only reduced waste but also showcased jute's versatility and potential for sustainable interior design. The entire process involved 10 stages, from collection to product manufacturing, demonstrating a cost-effective and environmentally friendly alternative to traditional materials.

Findings

The study on jute fibre's potential for sustainable interior decoration revealed promising results. Jute

ropes, upcycled from discarded sacks, demonstrated exceptional tensile strength. The production process minimised waste and utilised natural dyeing methods. The jute ropes exhibited unique textures and patterns, enhancing aesthetic appeal. Overall, jute fibre showed remarkable sustainability benefits, biodegradability, and durability, making it a viable alternative to traditional materials for interior decoration.

To contextualise these benefits, Table 3 presents a detailed comparison between jute and other commonly used synthetic materials (Polyester and Acrylic), highlighting environmental, functional, and aesthetic characteristics.

Table 3: Comparative Advantages of Jute Fibre

Feature	Jute fibre	Polyester	Acrylic
Environmental Impact	Biodegradable, renewable, minimal environmental footprint	Non-biodegradable, petroleum-based.	Non-biodegradable, contributes to microplastic pollution
Aesthetic Quality	Natural, rustic, warm appearance	Shiny, uniform finish	Soft texture, artificial sheen
Workability	Easily twisted, braided, coiled, and hand-manipulated	Requires machine processing for strength and uniformity	Requires machine processing; less suitable for handcrafting
Durability	Strong with proper stitching; maintains shape and structure over time	Highly durable; resistant to abrasion and stretching	Durable; may pill or lose shape under heavy use

As shown in Table 3, jute fibre demonstrates clear advantages over Polyester and Acrylic in terms of environmental impact, biodegradability, and suitability for handcrafting. While synthetic fibres offer higher uniformity and durability, jute provides superior aesthetic appeal, flexibility, and low environmental impact. These attributes reinforce its potential as a sustainable alternative for interior décor, particularly in artisanal and upcycled applications.

CONCLUSION

This study contributes to the growing interest in sustainable interior design, highlighting jute fibre's potential as an eco-friendly, aesthetically pleasing material. The study confirms jute fibre's viability as a sustainable material for interior decoration, offering:

1. Environmental benefits (biodegradable, renewable, carbon footprint reduction)
2. Aesthetic appeal (natural texture, earthy tone)
3. Durability and strength
4. Cost-effectiveness

The integration of jute fibre into interior decoration offers a practical pathway to environmentally responsible design while maintaining functional and aesthetically pleasing interior spaces.

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