



The Path to Sustainability: Anticipating the acceptance of Eco printing Method in the upcoming markets

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Abstract

This research explores eco printing, a sustainable textile printing technique that transfers pigments and patterns from botanical materials onto fabric. It reduces the ecological footprint by avoiding harmful chemicals and synthetic dyes, promoting unique nature-inspired designs. The study surveyed textile professionals in Jaipur, employing quantitative research to measure support for eco printing and consumer preferences for environmentally friendly clothing. Results confirmed increasing awareness and preference for eco-friendly options. Established brands play a crucial role in embracing eco printing. The research contributes to sustainable practices in the fashion industry, highlighting the potential for eco printing to offer environmentally friendly choices. Recommendations include engaging influencers to promote wider acceptance of eco printing.

Keywords: Eco printing, sustainable textile printing, botanical materials, ecological footprint, consumer preferences, established brands.

Introduction

Eco printing, which directly transfers colours and patterns from botanical materials onto fabric using leaves and flowers, is a sustainable textile printing. This approach yields distinctive designs that honour the beauty of nature and are inspired by it. One of the main benefits of eco printing is its capacity to lessen environmental impact by avoiding the use of hazardous chemicals and synthetic colours frequently used in conventional textile printing techniques. Eco printing, which encourages a more environmentally friendly approach to textile creation, instead makes use of the natural colours present in leaves and flowers.[6]

Eco printing helps to reduce the negative environmental effects of the textile industry by utilising these organic and sustainable materials. Eco printing also adopts a closed-loop strategy, reducing waste production. Following the application of the pigments to the cloth,

the leftover plant matter can be composted to replenish the soil's nutrients and complete the sustainable cycle.[5]

The goal of ongoing research in the field of eco printing is to bridge the knowledge gap and comprehend the shift to eco-friendly printing. The goal of this study is to examine and encourage the use of eco printing in emerging markets, hence advancing the development and widespread adoption of sustainable textile practices.[3,5]

Terminology

- **Eco-printing:** The process of imprinting a design using natural pigments derived from plant sources on fabric.
- **Eco-dyeing:** The chemical bonding procedure that produces a surface with dye prints.
- **Contact printing:** A method of printing where the design is directly transferred onto the fabric.
- **Botanical materials:** Plant-based components used in eco-printing, such as leaves and flowers.

Exploring the Roots: Tracing the History of Eco Printing

Eco printing, also known as botanical printing has its origins in ancient practices of natural dyeing and printing. Traditional techniques using plant materials to create patterns on fabric can be found in various cultures worldwide. In recent years, the revival of eco printing gained momentum, with artists like India Flint playing a significant role. Flint's experiments with plant-based dyes and contact printing techniques popularized eco printing as a sustainable practice. Today, eco printing is a globally recognized art form that merges creativity, sustainability, and natural materials, honoring the ancestral roots of textile design while embracing a more environmentally conscious future.[5]

Unveiling the Significance: The Intrinsic Value of Sustainability

The essential significance of eco printing with leaves and flowers is that it encourages sustainability. It protects the beauty of nature, emphasises the use of sustainable resources, lowers chemical exposure, completes the sustainability cycle, and stimulates creativity. This environmentally friendly method produces visually attractive textile designs while promoting industry-wide sustainable practises by utilising natural colours collected from plants. By fusing creativity with environmental awareness, it acts as a catalyst for improvement.[4,5]

Objective

- To understand the principles and methods of creating eco-printed patterns on natural fabric.
- Evaluate consumer willingness to pay a premium in eco printed clothing and home furnishing items.
- Investigate consumer trends and preferences regarding sustainable textile products, specifically eco-printed natural fabric.

- Determine the level of support for eco printing in the fashion and textile industry.

Literature Review

Research on textiles includes many facets of colorfastness, eco-friendly printing techniques, and the use of natural dyes on fabrics. The important findings from the chosen sources are outlined in the literature review that follows.

1. 'M. Kavyashree,' 'Printing of Textiles Using Natural Dyes: A Global Sustainable Approach': This academic paper explores the use of natural dyes in textile printing as a global sustainable practise. It focuses on the significance of environmentally friendly practises in the textile business while examining the environmentally friendly properties of natural dyes, their suppliers, and application methods
2. The essay, titled "Samanta AK, Agarwal P. Application of Natural Dyes on Textiles," focuses on this topic. It offers information on various natural dye sources, extraction procedures, and colouring methods. The study emphasises the potential of natural dyes as a replacement for synthetic dyes while taking into consideration their traits and qualities.
3. The International Journal of Creative Research Thoughts article titled "Ms. Deepshikha Sahu, ECO-PRINTING" explains the idea of eco-printing, which entails employing organic materials and plant dyes to produce distinctive patterns on textiles. It focuses on the environmentally beneficial features of this printing method and its possibilities for environmentally friendly textile manufacturing.
4. "Eco printing on Cotton" by Barb, 5 November 2017: The blog post primarily covers cotton cloth eco-printing methods. It offers help for those interested in learning more about this innovative and ecological type of textile printing by delivering practical insights, advice, and examples of eco-printing techniques.
5. Crockmeter Method: AATCC 8-2016.Edition, 2022 - Test Method for Colorfastness to Crocking: Using the crockmeter method, the AATCC 8-2016.Edition test method offers a standardised way to evaluate a textile's colorfastness to crocking. Utilising this technique, textile producers can assess the likelihood of colour transfer during rubbing or abrasion.

Research Methodology

The research methodology involved practical experimentation with eco printing to gain firsthand experience and in-depth knowledge about the technique. This hands-on approach aimed to explore the visual outcomes and assess the effectiveness of eco printing in the fashion and textile industry. The goal of the study, which involved eco printing, was to comprehend the value and potential of this ancient technique as well as its applicability to modern design.

Two Ways to Conduct Eco Printing

- I. From Plants to Prints: A Comprehensive Exploration of the Eco Printing Process through Boiling
- II. The Dance of Pigments: Understanding the Intricate Steps of Eco Printing through hammering leaves and flowers

From Plants to Prints: Eco Printing through Boiling

The process The eco printing process involved three key steps: choosing the plant, treating the fabric, and choosing the mordant, then boiling procedures. Various leaves and flowers were chosen for the plants depending on their availability and pigment content.

A suitable mordant was chosen to support colour fastness, and the fabric was treated to improve dye absorption. The fabric was boiled with plant materials in the last process, allowing the pigments to transfer and produce distinctive eco prints.

Figure 1: This includes arrangement of leaves and flower in the desired pattern.



Figure: 1a

Figure: 1b

Figure: 1c

Figure 2: This includes folding of the fabric and tying it with cotton thread



Figure: 2a

Figure: 2b

Figure: 2c

Figure 3: These pictures show the process of dipping swatches in iron water that works as mordant also boiling and post boiling image of swatches



Figure: 3a

Figure: 3b

Figure: 3c

Examining results

By doing trials with diverse leaves and blossoms, it was possible to examine how varied plant materials affected prints and patterns. The colours, patterns, and levels of intensity that each plant material generated on the fabric were distinctive. Additionally, the pigments' colour was changed by the employment of various mordants, giving rise to a variety of colours and tones. These data shed important light on the interaction between plant selection, mordant selection, and the aesthetic results of eco printing.



Figure:4a



Figure: 4b



Figure: 4c

Analyzing possibilities

It was necessary to look at a number of elements, including the kind and concentration of mordant, the composition of the fabric, and the length of the boiling process, in order to analyse the factors impacting colour fastness and durability in eco-printed textiles. The ideal circumstances that guarantee long-lasting and sturdy eco-printed designs could be found by methodically examining these options.



Figure: 5

II The Dance of Pigments: Understanding the Intricate Steps of Eco Printing through hammering leaves and flowers

The process-The eco printing process through hammering involved three steps: selecting the plant material, choosing the mordant, and getting the fabric ready. For their pigments, various leaves and flowers were chosen. An appropriate mordant was chosen after the fabric underwent treatment to improve colour absorption. Following the placement of the plant materials on the cloth, the pigments were transferred onto the fabric by hammering, creating one-of-a-kind eco prints.

Figure 6: This stage is collecting foliage and flowers for eco printing.



Figure: 6

Figure 7: Arranging Flowers and leaves in desired pattern.

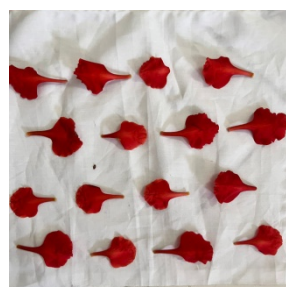


Figure: 7a



Figure: 7b



Figure: 7c

Figure 8: Hammer your flower sandwich until you've extracted your desired color and detail from the foliage.



Figure: 8a



Figure: 8b



Figure: 8c

Examining results-Examining the outcomes of eco printing allowed us to analyze the artistic effects and distinctive patterns produced by the hammering process. The pigments from the plant components were transferred onto the cloth during the hammering process, producing different colour effects. Additionally, the delicately detailed foliage and flowers were delicately imprinted onto the cloth, creating eye-catching eco prints with a wealth of fine details.



Figure: 9a



Figure: 9b



Figure: 9c

Analyzing possibilities

Investigating elements like hammering pressure, fabric type, moisture content, and the length of hammering allowed researchers to analyse the potential effects of the hammering process on pigment transfer and print lifetime. The ideal circumstances that guarantee efficient pigment transfer and durable eco prints could be found by methodically investigating these variables. This investigation offered insights into how technique and materials interact, helping to improve understanding of how to accomplish desired outcomes and increase the durability of eco-printed designs.



Innovative Product Creation

In addition to the research study, a practical application of eco printing was undertaken by employing the hammering technique. This method ensured that the colors remained vibrant and did not spread, resulting in intricate and detailed designs.



BEDSHEET and PILLOW COVERS:

Product – single bed sheet, two pillow cover
Composition- 100% cotton
Quantity- 1Bedsheet ,2 pillow cover
Colour – printed white bed sheet and pillow covers
Fabric length x width – 87” x 52” of bed sheet
17” x 26” of pillow cover
Description – A single white cotton bed sheet and pillow covers with eco print on it by hammering process called Hapa Zome, A Pound at a Time.



This practical project offered as a physical illustration of the creativity and complexity inherent in eco printing, as well as improving our grasp of eco printing procedures.

Impeccable Craftsmanship

The bed sheet and pillowcase eco-printing process was expertly crafted, guaranteeing perfect attention to detail.

A visually striking and aesthetically pleasing product was made possible by all factors, from the choice of leaves and blossoms to their correct positioning and hammering.



Time and Dedication

The 15-days duration, with consistent daily efforts of 2 hours, demonstrates the labor-intensive nature of eco printing. This aspect highlights the time and dedication required to achieve high-quality eco-printed textiles.

Sampling: To ensure a representative sample for thorough insights, a survey targeting textile and fashion professionals in the Jaipur area was conducted. The focus was on those aged 18 and above who were employed in the fashion and textile industries.

Quantitative Research: Quantitative research was used to gather numerical data, gauge customer preferences for eco-friendly apparel and home furnishings, and gauge the level of support for eco printing. This data provided a basis for analysis.

Hypothesis Testing: The hypothesis, which was motivated by worries about synthetic dyes and fabrics, was that rising environmental consciousness is correlated with a preference for eco printing. This thorough testing contributed to the overall findings by providing statistical data to support or refute the hypothesis.

Premium Pricing Analysis: Given the labor-intensive nature of the process and the possibility for money generation, premium pricing analysis looked into consumer willingness

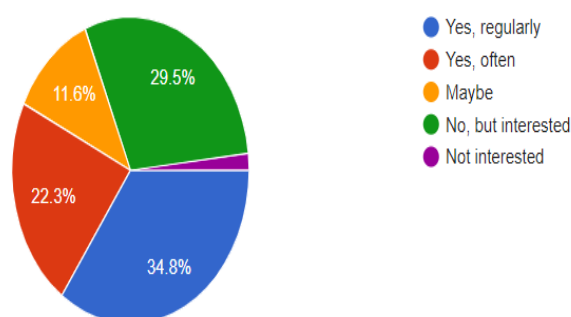
to pay a premium for eco-printed products. The economic viability of eco printing and its market potential were clarified by this investigation.

Importance of Established Brands: This study looked at how established companies can affect environmental conservation by adopting eco-friendly printing techniques, as well as how they might drive industry acceptance and perhaps create sustainable trends.

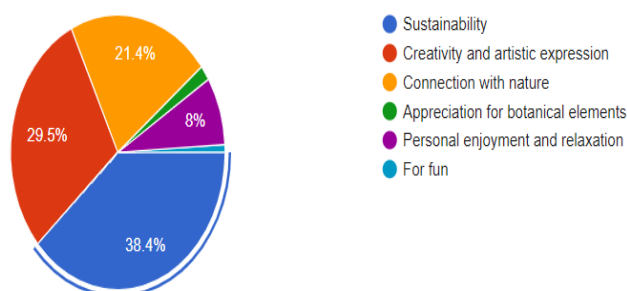
Comprehensive Study: To get a deep grasp of eco printing and its potential for innovation and exploration, a comprehensive study was conducted, including in-depth research and testing. This method allowed for the discovery of fresh thoughts and viewpoints within the discipline and ensured a thorough investigation of the issue.

Survey Results

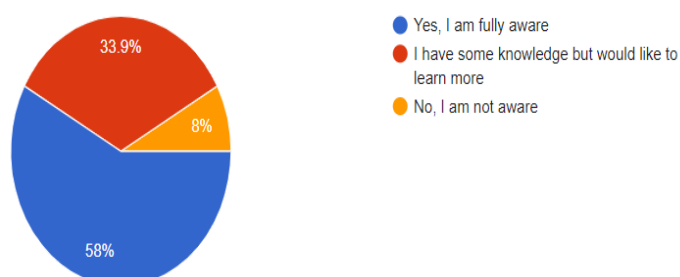
Q1. Have you personally practiced Eco Printing through leaves and flowers?



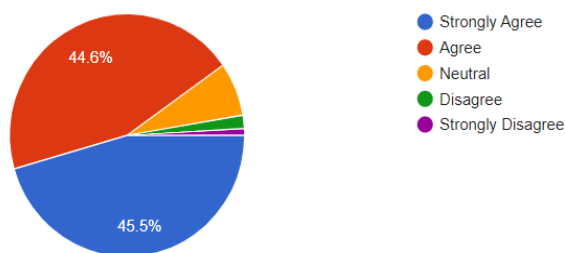
Q2. If you practice Eco Printing or are interested in it, what are your main motivations?



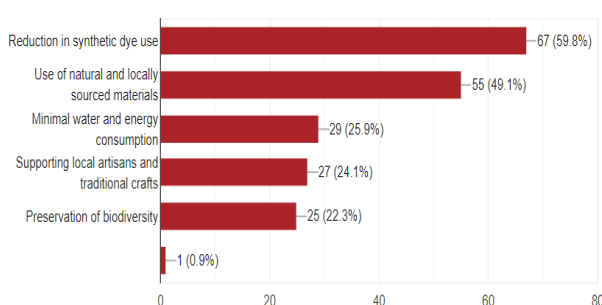
Q3. Are you aware of the environmental benefits associated with Eco Printing through leaves and flowers?



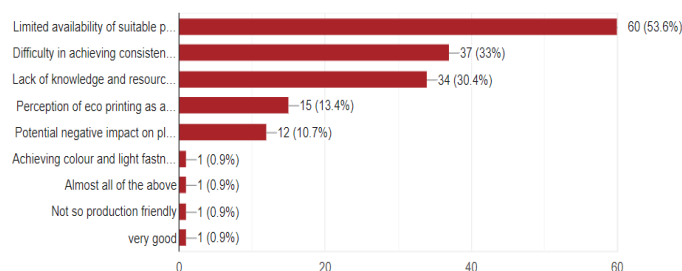
Q4. In your opinion, do you believe that practicing Eco Printing through leaves and flowers is beneficial for promoting sustainability?



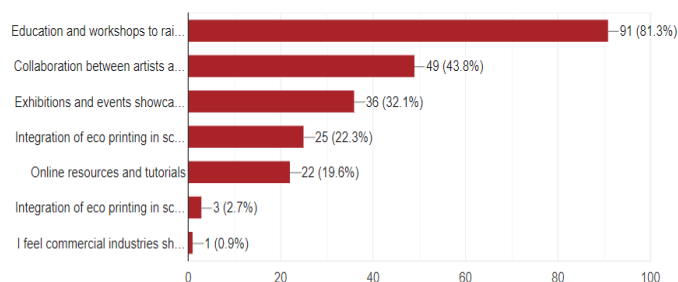
Q5. If you believe that eco printing promotes sustainability, what factors contribute to this perception? (Please select all that apply.)



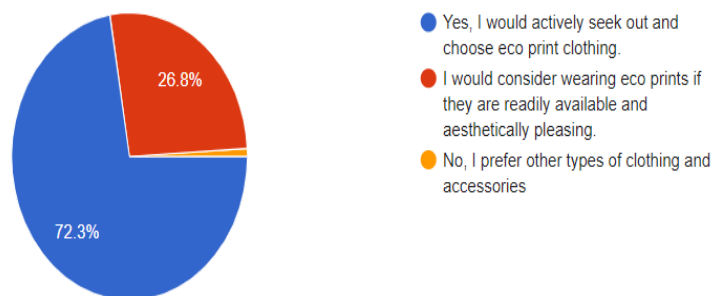
Q6. What challenges or concerns do you associate with practicing eco printing through leaves and flowers for sustainability? (Please select all that apply.)



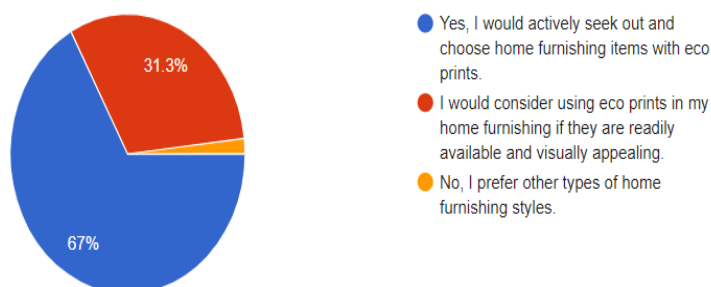
Q7. In your opinion, how can eco printing through leaves and flowers be promoted further for sustainability? (Please select all that apply.)



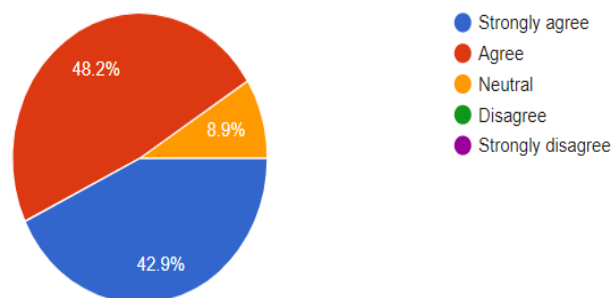
Q8. Would you prefer wearing clothing or accessories made with eco prints ?



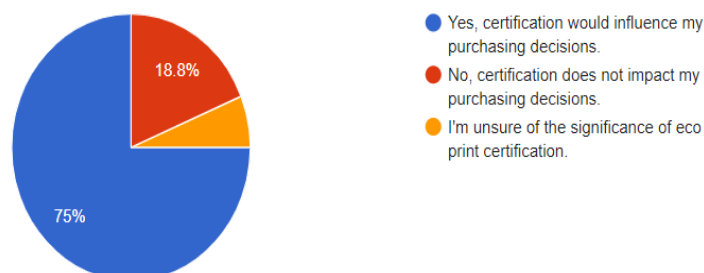
Q9. Would you consider incorporating eco prints in your home furnishing, such as textiles, wallpapers, decorative items?



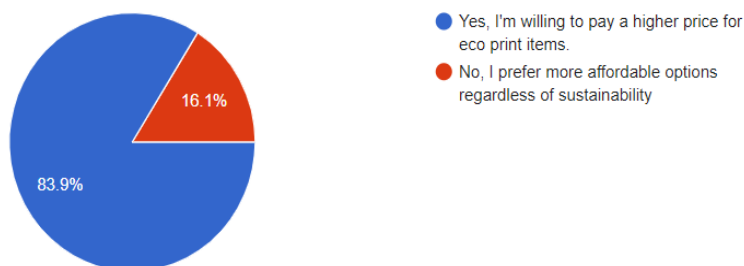
Q10. In your opinion, do you believe that eco prints can enhance the fashion industry and home furnishing in terms of sustainability and aesthetics?



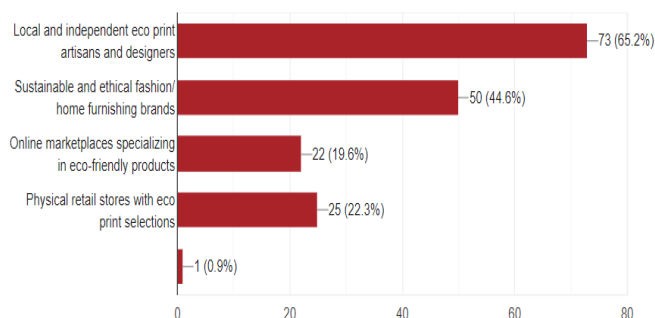
Q11. Would you be more likely to purchase eco print clothing or home furnishing items if they were certified as environmentally sustainable and ethically produced?



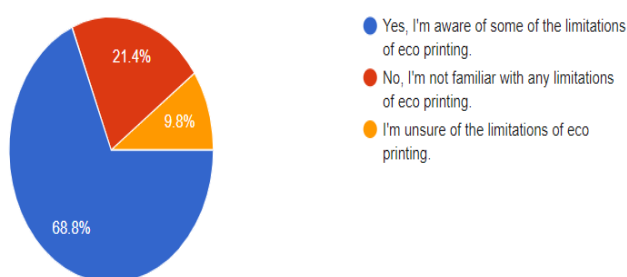
Q12. Would you be willing to pay a premium for eco print clothing or home furnishing items due to their sustainable and eco-friendly nature?



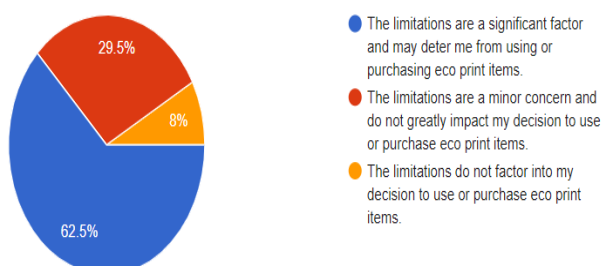
Q13. Where would you prefer to purchase eco print clothing and home furnishing items? (Please select all that apply.)



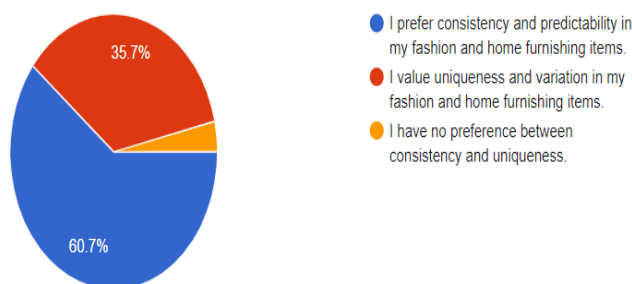
Q14. Are you aware of any limitations or drawbacks associated with eco printing through leaves and flowers, such as color fading, limited color palette, or variation in outcomes?



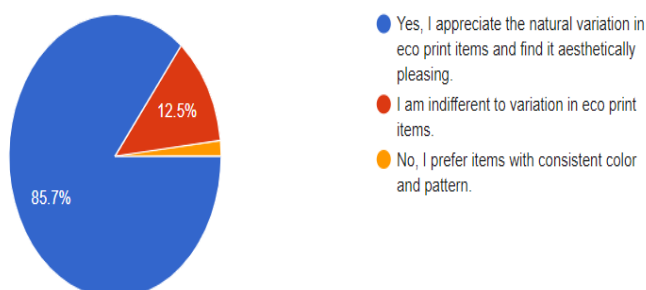
Q15. How important are the limitations of eco printing in your decision to use or purchase eco print items?



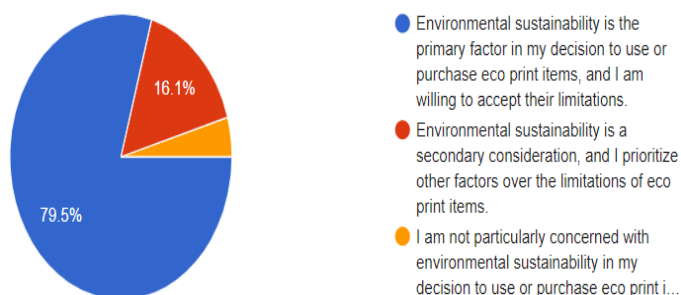
Q16. Do you prefer consistent and predictable outcomes in your fashion home furnishing items, or do you value uniqueness and variation in the final product?



Q17. Would you be willing to accept variation in the color or pattern of eco print items due to the nature of the eco printing process?



18. How important is environmental sustainability in your decision to use or purchase eco print items, even if they have limitations compared to conventional items?



Research Findings

The quantitative research used in this study produced insightful results about the degree of interest and support for eco printing among the study's target audience. The findings supported the initial theory and showed that consumers are becoming more aware of and inclined to favour eco-friendly clothes and home furnishings. The information acquired provides a reliable foundation for analysing industry trends and the demand for environmentally friendly printing. Notably, fashion experts and leaders in the textile business supported eco printing and emphasised the importance of well-to-do people and the upper middle class patronising this traditional trade. These findings highlight the potential for

environmentally friendly fashion practises and the need for continued initiatives to promote eco printing as an intelligent and ethical decision in the industry.

Furthermore, the research findings revealed that Consumers are also willing to pay extra for eco-printed products, according to the report, indicating that they are aware of how labor-intensive the process is and how important sustainable practises are. This means that enterprises have an expanding market potential to meet the rising demand for eco-friendly fabrics.

The report also emphasised how wellknown businesses can help advance environmental preservation by adopting eco-friendly printing practises, promoting industrywide acceptance, and establishing sustainable trends. These details highlight how important eco printing is as a practical means of encouraging sustainability in the fashion and textile sectors.

Conclusion

In conclusion, this research study significantly and valuably adds to the body of knowledge about sustainable practices in the fashion and textile sector. The study emphasizes the significance of offering ecologically friendly choices by highlighting the potential of eco printing as a way to achieve good environmental consequences. The findings not only create a solid framework for its implementation but also provide individuals, business owners, and well-known brands with useful advice on how to adopt eco printing as a viable and sustainable option.

Trendsetters, famous designers, and influencers must actively push the use of eco printing in order to achieve this. It is possible to generate more interest, boost credibility, and promote widespread acceptance of eco printing as a stylish and ethical choice by encouraging collaborations, forming partnerships, and launching targeted awareness campaigns that specifically involve these powerful stakeholders. The fashion and textile industries can fully embrace eco printing and make a big contribution to a more sustainable and responsible future by fusing the learnings from this research with successful engagement and collaboration tactics.

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