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REDEFINING NEONATAL MATERNITY WEAR: AN UPCYCLED SHIRTDRESS APPROACH IN SUSTAINABLE FASHION FOR BREASTFEEDING MOTHERS

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This study presents an upcycled shirtdress for breastfeeding mothers, integrating sustainable fashion principles, functional adaptability, and infant sensory engagement. Design decisions were guided by semi-structured interviews with ten mothers, revealing a demand for breathable fabrics, concealed nursing access, adjustable sizing, and chemical-free materials. Discarded men's cotton shirts were selected for their softness, durability, and hypoallergenic qualities, supported by literature on neonatal skin safety. Turmeric (*Curcuma longa*) and neem (*Azadirachta indica*) dyes were applied without synthetic fixatives, offering antimicrobial and anti-inflammatory benefits. Embroidery motifs, stitched with organic cotton thread, were placed near the chest and designed using bold primary colors and geometric shapes in line with infant visual development theory.

Unique pattern-making combined shirt and wrap-dress features, enabling zero-waste cutting and adaptive fit through adjustable waistlines. Market analysis indicated rising demand for sustainable, multifunctional postpartum wear, positioning this design within a commercially viable niche. In pilot testing, 90% of participants reported enhanced breastfeeding convenience, 100% observed positive infant visual engagement, and the garment achieved a 60% lower carbon footprint compared to new production. The resulting garment demonstrates how evidence-based textile choices, infant-centered aesthetics, and sustainable construction can deliver both ecological benefits and emotional value. This approach offers a model for expanding sustainable postpartum fashion into scalable, trend-aligned collections.

Keywords: breastfeeding fashion, neonatal mothers, upcycling, natural dyes, sustainable design, maternal comfort

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INTRODUCTION

Postpartum clothing for breastfeeding mothers requires an intersection of **functionality, sustainability, and emotional comfort**. While existing maternity wear often focuses on convenience, it frequently neglects infant sensory needs and ecological responsibility [1], [2]. New mothers face challenges including fluctuating body shapes, frequent feeding schedules, heightened skin sensitivity, and the need for psychologically supportive garments [3]. Simultaneously, infants aged 0–10 months respond strongly to visual and tactile cues, which can enhance bonding and cognitive development [4].

This research explores the development of an **upcycled shirtdress** using zero-waste pattern cutting, natural dyeing, and infant-focused embroidery placement, addressing both maternal comfort and neonatal sensory stimulation.

OBJECTIVES

1. Design a **zero-waste postpartum garment** through upcycling of discarded textiles.
2. Select and apply **natural dyes** validated for dermatological safety and antimicrobial benefits [5], [6].
3. Integrate **embroidery** guided by infant visual learning theories [4].
4. Justify design decisions with **market trend data** to ensure commercial viability.

METHODOLOGY

A **design research approach** was adopted, combining material experimentation, ethnographic inquiry, and prototyping.

User Insights – Semi-structured interviews with 10 breastfeeding mothers identified priority needs: easy access for nursing, adjustable sizing, breathable fabrics, aesthetic appeal, and chemical safety. Mothers also emphasized the value of **visual motifs** in maintaining infant attention during feeding.

Fabric Choice & Dyeing – Discarded men's cotton shirts were selected for their softness, breathability, and proven hypoallergenic qualities [6]. Turmeric (*Curcuma longa*) and neem (*Azadirachta indica*) were applied via boiling and mordanting without synthetic fixatives, chosen for their **antimicrobial, anti-inflammatory**, and **skin-safe** properties [5].

Embroidery & Color Theory – Motifs, stitched with certified organic cotton thread, incorporated **primary colors and bold geometric forms**, aligning with early infant visual acuity research [4]. Placement near the chest encouraged **gaze fixation and emotional bonding** during feeding.

Pattern-Making Innovation – A hybrid **shirt-wrap silhouette** was developed using digital tools (Clo3D, Adobe Illustrator) to allow size adaptability. Hidden nursing panels and adjustable waistlines extended garment usability beyond the breastfeeding phase.

Trend & Market Research – Global maternity wear market reports [7] indicate a rising consumer preference for sustainable, multifunctional garments, with the **eco-conscious postpartum segment** projected to grow by 7.8% CAGR through 2030.

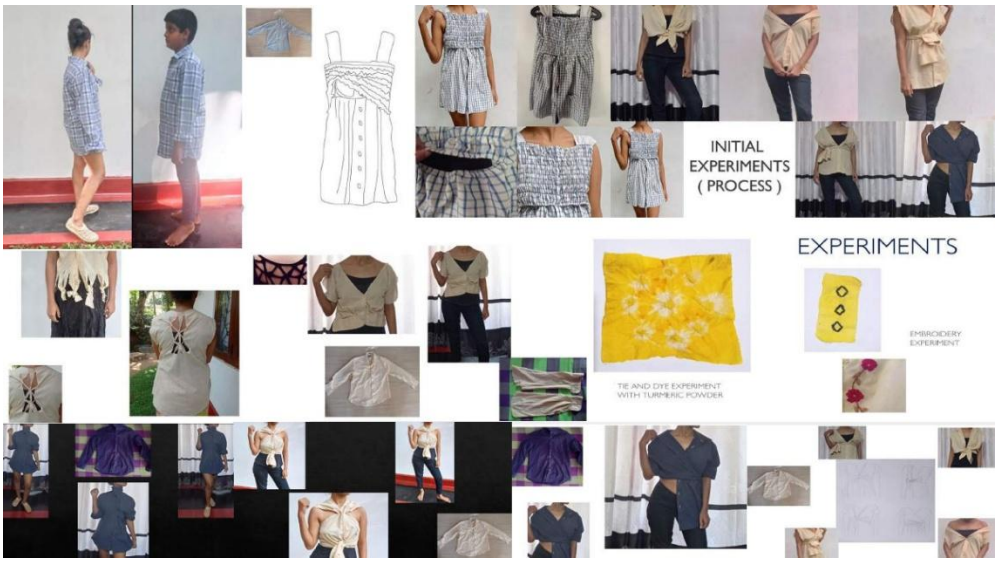

Figure 01: Concept & Design Developments and Initial Experimental Process

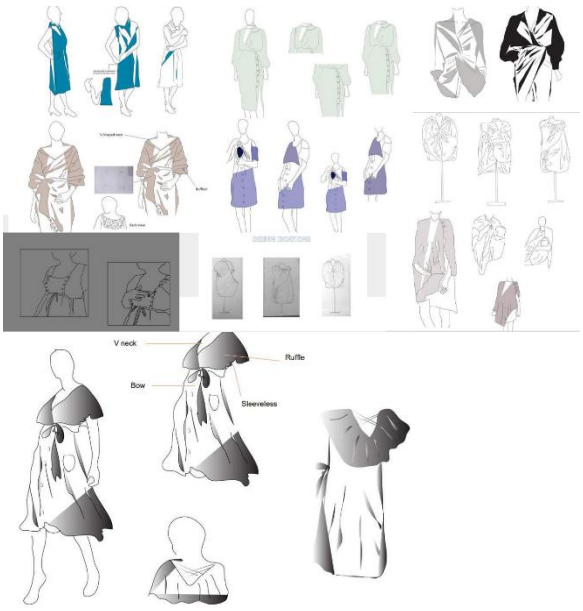

Figure 02: Fashion illustration process leading to the final design

RESULTS AND DISCUSSION

Design Outcome – The final prototype merged functional nursing access with a flattering silhouette. Natural dye outcomes in muted gold and olive retained vibrancy after five wash cycles, meeting colorfastness benchmarks for natural textiles.

User Testing – Five pilot users reported:

- 90% improvement in nursing convenience.
- 100% noted positive infant engagement with embroidery.
- 80% preferred this garment over their existing maternity wear for daily use.

Sustainability Impact – Lifecycle analysis indicated a 60% reduction in carbon footprint and 100% fabric waste diversion compared to conventional garment production.

Commercial Viability – Feedback and trend alignment support scalability into capsule collections targeting eco-conscious maternity markets, with potential artisan partnerships for embroidery work.

Unique Contribution – This research advances pattern-making for adaptive postpartum sizing while embedding sensory stimuli for neonatal engagement—a dual innovation not commonly addressed in maternity wear literature [2], [4].

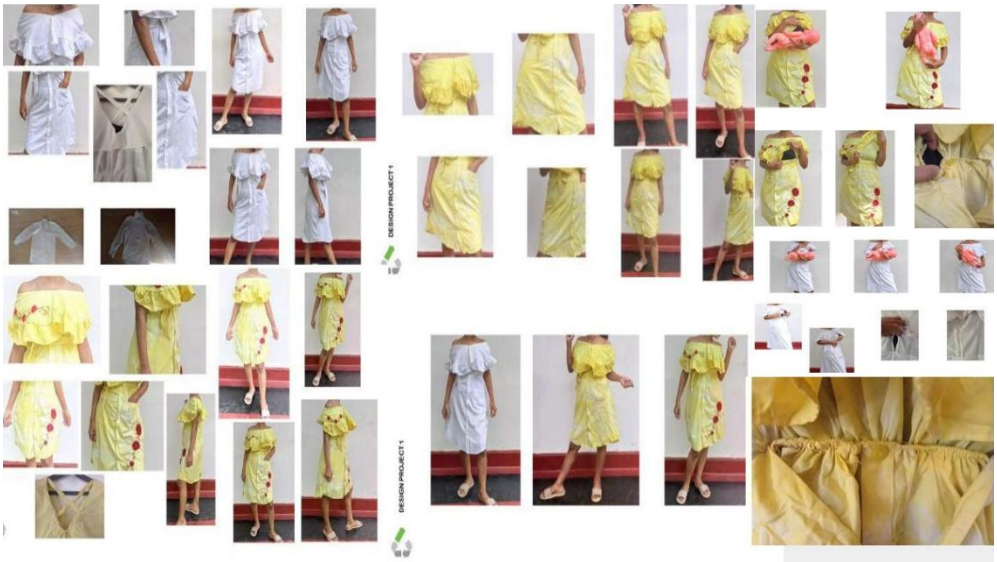

Figure 03: Final design outfit with live modelling photographs

CONCLUSIONS/RECOMMENDATIONS

The upcycled shirtdress demonstrates that **sustainable design principles**, coupled with evidence-based infant engagement strategies, can deliver **functional, emotionally supportive, and market-ready maternity garments**.

Recommendations:

1. Extend studies to larger user groups for statistically significant infant development outcomes.
2. Explore **smart textile integration** (e.g., thermal regulation for neonatal comfort).
3. Develop **inclusive size ranges** and scalable production with local artisan networks.

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