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Ahmedabad City's Biodegradable And Modular Event Seating And Decor

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Abstract:
This study investigates the ideation, development, and deployment of a modular, biodegradable, and sustainable event seating and décor system specifically for Ahmedabad. Through the use of environmentally friendly materials like bamboo, bioplastics derived from mushrooms, and plant fiber composites, the system encourages environmental responsibility in the events sector. Tool-free assembly and disassembly are made possible by the modular design, which promotes reuse and reduces waste at events like festivals, weddings, and business gatherings. This study assesses the system's scalability, cost-effectiveness, usability, and environmental impact in urban event management.

Keywords: Eco-friendly Event Furniture

1. Introduction:

Due to single-use seating and décor, Ahmedabad, a city rich in culture, holds a lot of events all year long, which greatly degrades the environment. In keeping with India's increasing focus on green infrastructure and the global climate goals, this article suggests a sustainable substitute. For a biodegradable event system, the study looks at local adaptation, flexibility, aesthetic integration, and material choice.

2. Objectives:

- To create a system of lightweight, foldable event furnishings and décor out of recycled, biodegradable, or compostable materials.
- To incorporate a modular design that enables disassembly and assembly without the need for tools.
- To evaluate the system’s potential social, economic, and environmental advantages in Ahmedabad.

3. Literature Review:

Many studies on sustainable design have been conducted as a result of the growing urgency to reduce environmental degradation in metropolitan areas, particularly in the event management sector. Research highlights the detrimental environmental impact of temporary event infrastructure, especially in places like Ahmedabad where regular business and cultural events generate a lot of waste (Ahmedabad Municipal Corporation, 2024). This has increased the need for creative solutions that balance environmental responsibility with usefulness.

3.1 Sustainable Event Infrastructure: According to Singh and Patel (2023), there are a lot of chances to include eco-friendly methods into urban events in India.
They promote a shift to sustainable systems that combine practicality and beauty, highlighting the environmental cost of single-use, non-recyclable décor. Their approach establishes a solid foundation by emphasizing the need for systemic changes in planning and procurement as well as consumer preparation for eco-conscious events.

3.2 Biodegradable Material Innovation: Kumar et al. (2022) focus on material science advancements in biodegradable furniture design. They analyse plant-based alternatives such as mycelium and hemp composites, citing their biodegradability, structural integrity, and economic feasibility. This aligns closely with the current study's emphasis on bamboo, mycelium-based bioplastics, and plant fiber composites, offering empirical support for their suitability in urban furniture applications.

3.3 Using Modular Design as a Strategy for Sustainability: A key tactic for cutting waste and boosting reuse is the modularity concept, which has been extensively studied in industrial and product design (Gupta, 2023). Gupta's investigation on modular systems in the Indian event industry demonstrates how disassembly-friendly design may transform event logistics by reducing labor expenses, material turnover, and expenditures. By incorporating tool-free, collapsible characteristics that allow for scalability and versatility, the current study expands upon this foundation.

3.4 Local Context and Implementation Challenges: While global literature offers robust frameworks for sustainability, regional implementation in Indian cities introduces unique challenges and opportunities. The Ahmedabad Municipal Corporation's (2024) waste management report details the disproportionate burden of event waste on city sanitation systems, indicating an urgent need for locally adaptable solutions. This context-specific concern substantiates the case study approach adopted in the research, where local vendors, materials, and user feedback informed the system's design.

3.5 User-Centered Evaluation: Although many studies focus on ecological metrics, few address user experience in sustainable event design. This research bridges that gap by incorporating feedback from attendees and event organizers, a methodology that echoes Singh and Patel's (2023) call for stakeholder-inclusive development. The high satisfaction ratings observed in the pilot event suggest a positive correlation between modular aesthetics and public engagement in sustainable practices.

In conclusion, the literature now in publication offers a multidisciplinary basis that supports the conceptual viability of biodegradable event systems, ranging from modular engineering and material science to urban sustainability design. The integrative, field-tested methodology used in Ahmedabad's event ecology, however, sets this study apart and provides useful insights for scalable, context-sensitive implementation.

4. Materials and Methods: A mixed-method approach was used in the project, which included stakeholder interviews (event planners, vendors, and sustainability specialists), CAD modeling for design prototypes, and material science analysis. Among the important materials examined were:

4.1 Bamboo: Strong, locally accessible, and quickly renewable.

4.2 Mushroom-based Bioplastics (Mycelium): Compostable and cultivated from agricultural waste.

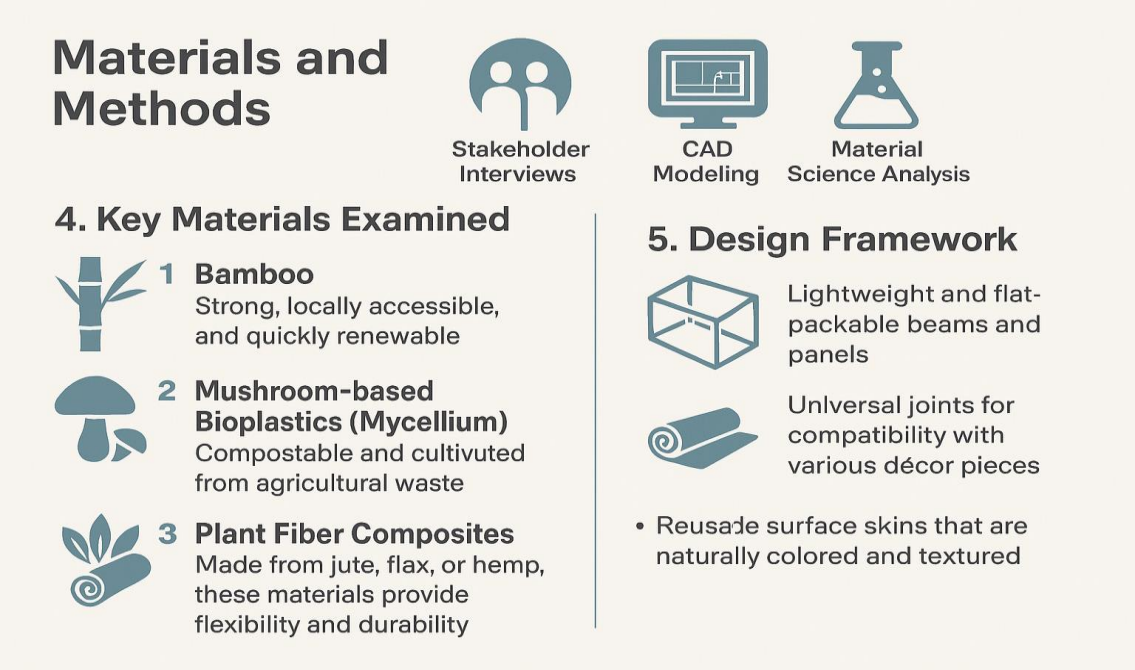
4.3 Plant Fiber Composites: Made from jute, flax, or hemp, these materials provide flexibility and durability.
The prototypes' ability to support loads, withstand weather, and be reused were all evaluated.

5. Design Framework: Using foldable frameworks and interconnected parts, the modular system is made to accommodate a range of themes and scales. Important characteristics include:

beams and panels that are lightweight and flat-packable.

For compatibility with various decor pieces, use universal joints.

Natural-colored and textured surface skins that can be reused.



6. Case Study:

Ahmedabad Pilot Event: During a moderately sized cultural festival in Ahmedabad, a pilot setup was put into place. Over 300 guests were accommodated by the furniture and décor system, which required no tools to assemble and was completely disassembled and repurposed after the event. High levels of satisfaction with comfort, aesthetics, and environmental consciousness were reported in the feedback.

7. Findings and Conversation:

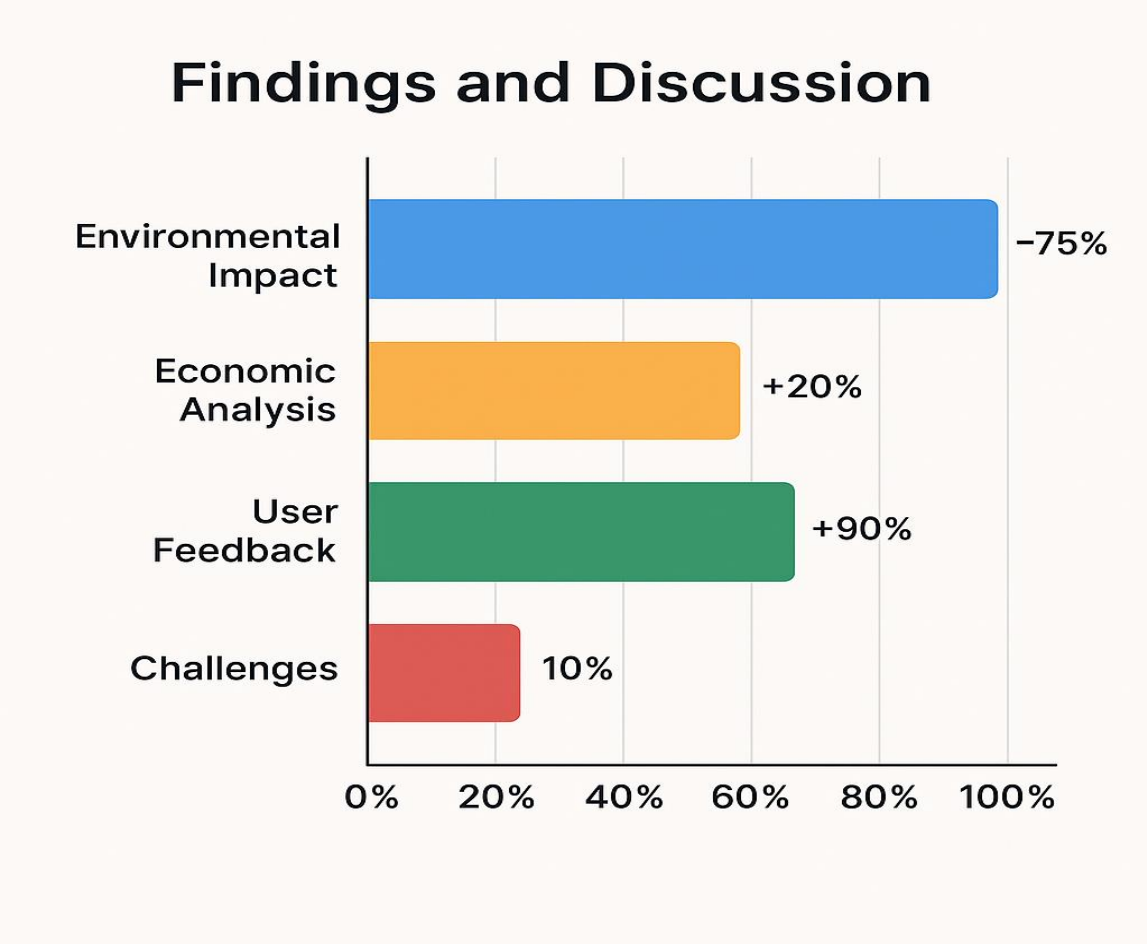
7.1 Environmental Impact: Non-biodegradable trash is expected to be reduced by 75%.

7.2 Economic Analysis: Reuse provided long-term savings, although upfront expenditures were 20% greater than those of traditional systems.

7.3 User Feedback: Convenience and aesthetic appeal were emphasized in the 90% approval rating given by organizers and participants.

7.4 Difficulties: Initially acquiring novel materials and limited scalability for really large events.

Category	Key Insight	Quantitative Data
Environmental Impact	Reduction in non-biodegradable waste	75%
Economic Analysis	Higher initial cost but savings through reuse	20% higher upfront; long-term savings
User Feedback	High approval based on convenience and aesthetics	90% approval rating
Challenges	Material sourcing difficulties; limited scalability for large events	Qualitative (No % given)



8. Conclusion: The study shows that modular and biodegradable event systems can drastically lessen Ahmedabad's urban events' environmental impact. This strategy can be implemented in other Indian cities to promote sustainable event practices with the help of strategic alliances and policy assistance.

9. Recommendations: Government incentives for sustainable event materials. Training workshops for event planners on modular eco-design. Development of a rental and reuse network for such systems.

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