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Upcycling Event Waste: DIY Craft Kits for Sustainability and Circular Economy

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Executive summary

This research examines a new approach to minimizing the waste generated by large events such as conferences and festivals. Upcycling event waste material such as plastics, food waste, decorations, packaging, and textiles into do-it-yourself craft kits is the idea. By converting waste materials into something useful such as toys, accessories, and home decor, these kits aim to encourage sustainability, reduce landfill waste, and establish a circular economy. Collection of wastes, material quality control, scalability, consumer perception, demand from the marketplace, logistics, regulatory compliance, sustainability in the long term, innovation in products, and creating awareness are some of the issues that the project addresses. The project offers an innovative means to mitigate environmental influence, foster imaginative engagement, and foster a circular economy by recycling event waste as viable crafting supplies. By encouraging appropriate consumption and extending the life span of discarded materials, the scheme encourages a circular economy. Improved waste management strategies and awareness raising are proposed as solutions to issues like trash sorting, quality inspection, and customers' attitudes. Through creative, interesting, and sustainable methods, the project encourages long-term environmental awareness and helps to lower the overall trash impact.

Introduction

Increased environmental issues, waste minimization and sustainability have become crucial in the modern world. Such large events like conferences, weddings, and festivals generate a considerable amount of waste, which often ends up on landfills or in incinerators. The waste consists of plastics, leftovers, and ornaments. Environmental degradation and the global waste problem are both caused by this garbage. There is potential for sustainable innovation since much of it can be reused or recycled.

Creating DIY craft kits from event waste is one of the solutions. This process extends the lifespan of materials such as fabric trimmings and packaging by transforming different types of waste into creative, sustainable products. By reducing the demand for new raw materials and the amount of landfill waste, these kits support the circular economy, upcycling, and sustainable practices. Aside from minimizing trash, these kits educate people about sustainability through easy-to-understand instructions and inviting creation. To ensure the safe collection of recyclables, event organizers may collaborate with recycling firms. Moreover, upcycled items are unique and attractive to customers seeking greener alternatives. Ultimately, these kits give households and individuals an entertaining and creative means to become engaged with sustainability.

Literature review

1. Zavagno, A. (2021). Upcycling as a design strategy to innovate fashion processes and create a local value chain with the support of digital technologies: The Offbeat District case.

The fashion industry is more and more concerned with where digital transformation intersects with circular economy principles to meet sustainability needs. The circular economy approach seeks to minimize the environment's impact by separating economic growth from virgin resource use.

2. Boonpracha, J., Chanplin, P., Ngampipat, C., & Sermsri, N. (2024). "Upcycling for Repurposing Waste into Creative Products." Creativity Studies, 17(1), 192–206.

This article introduces a design approach to upcycling with the SCAMPER technique with an emphasis on converting waste into innovative products. It discusses how upcycling contributes to the circular economy, provides case studies of recycling materials, and evaluates the business opportunity and customer acceptance of recycled products.

3. Singh, J. (2022). The sustainability potential of upcycling.

Upcycling is a key strategy for sustainability, with initiatives like maker spaces and repair cafés promoting waste reduction and community engagement. A forthcoming study highlights their social and environmental benefits, focusing on DIY bicycle repair shops and their sustainability potential.

4. SARTORI, G. (2014). Upkit. The approach and methods for generate ideas in upcycle design field.

Upcycling supports closed-loop material flows by turning waste into valuable resources, essential for sustainability. While it’s a natural practice, systematic approaches are needed for long-term effectiveness. Standardized criteria can enhance its benefits, as noted in circular economy studies. An upcycling toolkit streamlines lifecycle analysis, manufacturing, and material selection, making methods more replicable and scalable.

5. Zink, T., & Geyer, R. (2017). "Circular Economy Rebound."

The article discusses potential rebound effects of circular economy methods, particularly in upcycling, which can sometimes lead to increased resource consumption and surplus production. It questions whether upcycling always reduces waste and highlights the need for systemic changes in production.

6. Sung, K. (2015). "A Review on Upcycling: Current Body of Literature, Knowledge Gaps and a Way Forward."

This review explores existing literature on upcycling in various industries, identifying knowledge gaps. It analyzes trends in fashion, furniture, and packaging while addressing challenges like material limitations and market attitudes. The research highlights the environmental benefits of upcycling and the role of do-it-yourself culture in promoting sustainability.

7. Niinimäki, K., et al. (2020). "The Environmental Price of Fast Fashion."

This paper examines the environmental impact of fast fashion and highlights upcycling as a solution to minimize textile waste. It discusses the fashion industry's unsustainability, illustrates successes through case studies, and analyzes consumer perceptions of upcycled garments. Barriers like perception and cost are identified, and the importance of knowledge in promoting upcycling is emphasized.

8. Bridgens, B., Powell, M., Farmer, G., Walsh, C., Reed, E., Royapoor, M., ... & Heidrich, O. (2018).

Industrialization and global supply chains have distanced people from materials, resulting in waste and short product lifespans. Upcycling tackles this issue by turning waste into higher-value items, promoting sustainability and creativity. It encourages a culture of reuse and fosters a closer relationship with materials.

9. Han, S. L. C., et al. (2017). "Standard vs. Upcycled Fashion Design and Production."

This paper compares upcycling methods with conventional fashion manufacturing, highlighting how recycled clothing reduces textile waste and examining consumer reactions. It emphasizes the need for innovative marketing and education on upcycling in design schools. Case studies show how brands can successfully implement upcycling, while challenges like profitability and scalability are identified.

10. Norris, L. (2019). "The Limits of Ethicality in International Markets: Imported Second-Hand Clothing in India."

This research analyzes the impact of imported used clothing in India, addressing its moral aspects and highlighting the potential of upcycling for local economic benefits. It includes case studies that showcase how second-hand clothes can become new products and explores consumer perceptions of upcycled clothing.

11. Brooks, A., & Fletcher, K. (2020). "Fashion, Sustainability, and the Anthropocene."

This book explores the link between fashion and environmental sustainability, focusing on how the Anthropocene impacts fashion waste. It highlights upcycling as a key strategy for reducing waste, discusses customer responses to sustainable fashion, and addresses barriers like accessibility and cost. The authors emphasize the importance of education in promoting upcycling and propose policies for integrating it into mainstream fashion, concluding with suggestions for future research.

12. Hawley, J. M. (2006). "Digging for Diamonds: A Conceptual Framework for Understanding Reclaimed Textile Products."

This research presents a model for evaluating upcycled textile products, emphasizing how upcycling gives used fabrics a second life. It uses case studies to illustrate effective processes and explores consumer acceptance and economic benefits in the fashion industry. The author identifies key challenges to scaling up upcycling and suggests legislative measures to promote it.

13. Pal, R., & Gander, J. (2018). "Modelling Environmental Value: An Examination of Sustainable Business Models within the Fashion Industry."

This essay examines sustainable business models in the fashion industry, focusing on upcycling. It explores integration methods, highlights successful brands through case studies, and addresses consumer demand and supply chain challenges. The report emphasizes policy recommendations for promoting reused items, the need for industry collaboration, and the profit potential of repurposed fashion, concluding with recommendations for future upcycling projects.

14. Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). "A Review on Circular Economy: The Expected Transition to a Balanced Interplay of Environmental and Economic Systems."

This review explores the circular economy and the role of upcycling in supporting its principles. It presents successful case studies, discusses the economic and ecological benefits, and outlines challenges to implementation. The report includes policy recommendations for upcycling initiatives and examines consumer perceptions, highlighting business contributions to sustainability.

15. Sung, K., Cooper, T., & Kettley, S. (2014). "Individual Upcycling Practice: Exploring the Possible Determinants of Upcycling Based on a Literature Review."

This research explores factors influencing upcycling behavior, highlighting motivations like cost savings and environmental benefits. Case studies showcase successful upcycling projects and identify barriers such as time and skill constraints. The authors suggest policies to support upcycling, emphasize the role of knowledge in DIY efforts, and

examine social media's impact on upcycling fashion and business opportunities. The study concludes with recommendations for further research on consumer behavior.

Problem statement

Major cultural, social, and business events are organized in urban centers such as Bhubaneswar, Delhi, and Mumbai, hence event waste generation becomes a big issue of municipal waste management. High trash generation during events is due to high pedestrian volumes, which often overwhelm existing waste management infrastructure.

Inadequate recycling rates, poor collection infrastructure, and poor waste segregation result in excessive use of landfills and pollution of the environment. To effectively deal with event-related trash in these cities, this research aims to analyze trends in waste generation during events, assess the efficiency of collection and recycling, and identify sustainable management methods.

Objective

1. To Analyze garbage production and Composition: Identify the composition of garbage in Bhubaneswar, Delhi, and Mumbai by comparing trends in total as well as per capita waste production.

2. To Measure garbage Collection and Recycling Performance: Check how efficiently each city's garbage collection, sorting, and recycling processes function.

3. To Provide Suggestions for Sustainable Waste Management: Provide suggestions for how to enhance the effectiveness of recycling, reduce dependency on landfills, and enhance segregation of waste.

Research methodology

Employing a descriptive research methodology, the study discusses garbage generation, collection rate, recycling rates, and landfill dependence during events in the selected cities based on quantitative and qualitative information.

Sample size

A total of 15 events from each of the three cities were sampled to ensure that true and accurate statistics were obtained. These events were:

- Bhubaneswar: Five events (public gatherings, cultural events)
- Delhi: Five events (concerts, shows, and religious events)
- Mumbai: Five events, including large weddings, business meetings, and sports events

Data collection methods

Waste management in Bhubaneswar, Delhi, and Mumbai is assessed based on the secondary data sources given below:

- Reports from the Department of Municipal Waste: These reports evaluate the efficacy of collection and disposal as well as revealing the quantity and types of waste generated during large events.
- Research studies and case studies: Government and academic studies illuminate effective recycling processes, landfill operations, and environmentally friendly waste management practices.
- Reports of the Government and NGOs: Such documents comprise rubbish cutback proposals, recycling plans, and guidelines on waste disposal while holding public events.

Data analysis techniques

The gathered secondary data is analyzed using both quantitative and qualitative methods to guarantee a thorough and organized investigation. In Bhubaneswar, Delhi, and Mumbai, these techniques aid in the interpretation of trends in event trash creation, waste composition, collection efficiency, and recycling efficacy.

A. Quantitative analysis

Comparing, through tables and bar graphs, the quantity of waste produced at events in three cities to identify the most and least wasteful events. The per-capita waste generation (g/person/day) indicator compares information between cities and examines the quantity of rubbish created per daily visitor to events to arrive at personal habits. Utilizes graphs to compare cities based on recycling efficiency, examining the ratio of collected to recycled garbage in each city. Illustrates trash types, recycling rates, and landfill reliance in the form of bar charts, pie charts, and line graphs.

B. Qualitative analysis

Recognizes issues with garbage sorting in urban areas, including poor public awareness and inadequate infrastructure. Analyzes existing waste management policies and discovers successful methods that can be adopted by other cities. Evaluates effective event waste reduction initiatives in India and around the world and offers recommendations for more efficient waste collection and recycling.

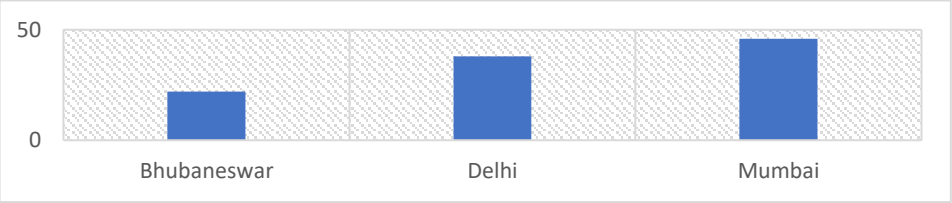
Data analysis

Per Capita Waste Generation (g/person/day)

City	Per Capita Waste Generation (g/person/day)
Bhubaneswar	300
Delhi	410
Mumbai	520
Grand Total	1230

The volume of trash generated per capita helps to assess the impact of participant activities and disposal practices. More usage and utilization of disposable products at events are indicated by Mumbai's superior per capita waste. Due to the presence of less single-use products and fewer groups, Bhubaneswar generates relatively less trash.

Post-Event Waste Comparison (%)



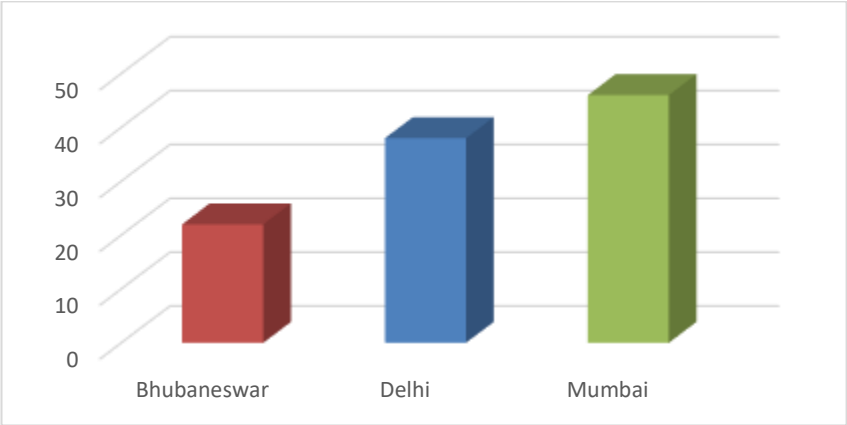
Post-event material breakdowns disclose details about possible segregation and recycling. Organic wastes at the events in all three cities consist predominantly of food waste and event biodegradable waste. There is much more plastic rubbish present in both Delhi and Mumbai, possibly a reflection that disposable plastic usage occurs to a greater degree during events.

Post-event waste recycling efficiency (%)

Environmental sustainability is directly affected by recycling effectiveness. The city of Mumbai has the best recycling efficiency, primarily due to enhanced segregation and scrap pickers who operate informally. Bhubaneswar's struggles with sorting garbage have an influence on recycling rates.

City	Waste separation level	Recycling efficiency (%)
Bhubaneshwar	Low	22
Delhi	Limited	38

Mumbai	Moderate	46



Profitability analysis of post-event waste products

Product from waste	Input material	Sale price (₹/kg or unit)	Processing cost (₹/kg or unit)	Profit margin (Approx.)
Recycled plastic pellets	PET bottles, wrappers	₹40-60	₹20-30	₹20-30
Compost	Food waste, leaves	₹5-10	₹2-3	₹3-7
Recycled paper	Used paper, cardboard	₹10-20	₹5-7	₹5-13
Aluminium scrap	Foil, cans	₹100-130	₹40-50	₹60-80
Glass recyclables	Bottles, containers	₹1-3	₹0.5-1	₹0.5-2

Post-event recycling can convert waste into useful products. Plastic and aluminium have high returns, while compost is eco-friendly. Proper segregation of waste is necessary to achieve maximum quality, which is good for the economy and the environment.

Interpretation and recommendations

A. Key interpretations

Mumbai and Delhi produce more trash during major events than Bhubaneswar, which has an issue with unsegregated waste disposal. Due to infrastructure problems, Mumbai tops the country with recycling (45%), followed by Delhi (35%), and Bhubaneswar (25%). Bhubaneswar utilizes 70% of its trash in landfills, while Mumbai utilizes 50% and Delhi 60%, respectively. Mumbai makes more efficient use of waste-to-energy.

B. Recommendations for effective event waste management

Implement a three-bin system (organic, recyclable, and non-recyclable) with visible signs and conduct awareness-raising activities. Offer incentives for recycling during events, and support unofficial rubbish collectors and recycling co-operatives. Enact zero-waste laws, promote composting, and build waste-to-energy plants in Delhi and Bhubaneswar to minimize the utilization of landfills.

C. Anticipated Results of Putting Suggestions into Practice

- Improved segregation methods and reduced waste generation from events.
- Less dependence on landfills and higher recycling levels.
- Improved efficiency in collecting and disposing of trash throughout activities.
- Stronger environmental regulations for facilitating sustainable event planning.

Conclusion

Through the conversion of waste into creative handicraft materials, the event waste recycling into DIY Craft Kits is a sustainable alternative to traditional waste disposal and fosters a circular economy. Key waste management issues such as efficient collection, sorting, and scaling up operations for various events are covered in this research. It's imperative to deal with consumer resistance via marketing and education to foster greater acceptance of the recycled products. Long-term survival requires financial viability, compliance with regulations, strategic logistics, and constant innovation. The do-it-yourself kits promote skill acquisition and imaginative participation alongside being environmentally friendly. All kinds of customers ranging from environmentally conscious consumers to households, schools, event planners, and artisans find the initiative appealing. Ultimately, it illustrates how waste can be converted into a valuable asset, paving the way for a more creative and sustainable future.

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